
ASCLEPIADOIDEAE (APOCYNACEAE) FROM SOUTHEASTERN BRAZIL. I. THE GENUS *OXYPETALUM* FROM RIO DE JANEIRO STATE, BRAZIL¹

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ABSTRACT

Most genera of the subfamily Asclepiadoideae (i.e., 29 genera) can be found in the southeastern Brazilian region. Among these, the most representative is *Oxypetalum* R. Br., with 71 taxa (including specific and infraspecific). In Rio de Janeiro State, there are 25 taxa of *Oxypetalum* that are climbers, with the exception of *O. patulum* E. Fourn., which is a suberect shrub and decumbent. Most taxa from Rio de Janeiro occur in secondary Atlantic Forest, but four are from sandy coastal plain (restinga) vegetation, namely *O. alpinum* (Vell.) Fontella & E. A. Schwarz var. *alpinum*, *O. pachyglossum* Decne., *O. banksii* Schult. subsp. *banksii*, and *O. banksii* subsp. *corymbiferum* (E. Fourn.) Fontella & C. Valente. The latter species is restricted to restingas. Some taxa occur in high-altitude grasslands, namely *O. costae* Occhioni, *O. lanatum* Decne ex E. Fourn., *O. patulum* E. Fourn., *O. sublanatum* Malme, *O. insigne* (Decne.) Malme var. *insigne*, *O. insigne* var. *glabrum* (Decne.) Fontella & E. A. Schwarz, *O. insigne* var. *glaziovii* (E. Fourn.) Fontella & E. A. Schwarz, and *O. regnellii* (Malme) Malme. Four species and one subspecies are endemic to the state of Rio de Janeiro: *O. costae*, *O. glaziovianum* Loes., *O. lutescens* E. Fourn., *O. schottii* E. Fourn., and *O. banksii* subsp. *corymbiferum*. Two species are cited here as new records for the state of Rio de Janeiro: *O. molle* Hook. & Arn. and *O. pannosum* Decne. var. *pannosum*. The following taxa are proposed as new synonyms: *O. sobralii* Occhioni (= *O. schottii*), *O. villosum* E. Fourn. (= *O. pachyglossum* Decne.), and *O. mourai* Hoehne (= *O. glaziovianum* Loes.). *Oxypetalum appendiculatum* Mart., *O. molle*, *O. pannosum* var. *pannosum*, *O. sublanatum*, *O. wightianum* Hook. & Arn., and *O. banksii* subsp. *banksii* are widely distributed, the first five reaching Paraguay and Argentina, while *O. banksii* subsp. *banksii* is limited to Brazil (from Alagoas to Rio Grande do Sul). Lectotypifications were made for the following species: *Calostigma guilleminianum* Decne., *Cystostemma glandulosum* Silveira, *Oxypetalum glaziovianum* Loes., *O. lanatum*, *O. mourai*, *O. pachyglossum*, *O. regnellii*, *O. schottii*, *O. selloanum* E. Fourn., and *O. sublanatum*. Types are designated for *Schizostemma* Decne. and *Pachyglossum* Decne. as synonyms of *Oxypetalum*.

Key words: Apocynaceae, Asclepiadoideae, Brazil, *Oxypetalum*, Rio de Janeiro.

Rio de Janeiro State is located in southeastern Brazil. It borders on the states of Minas Gerais to the north and northwest, São Paulo to the west, Espírito Santo to the northeast, and the Atlantic Ocean to the south, east, southeast, and southwest. It has an area of 43,909.7 km² and a coastline of 636 km. It belongs to the “Mata Atlântica” biome (Atlantic Forest), which is one of Brazil’s largest forest formations both in area and in species diversity, second only to Amazônia (Paula, 2004). According to Morellato and Haddad (2000: 786), “the year 2000 marked 500 years of massive destruction for the Brazilian Atlantic Forest, as a consequence of the colonization of Brazil. Today, the Atlantic Forest is restricted to ca. 98.800 km² of remnants, or

7.6 percent of its original extension,” and is one of the 25 biodiversity hotspots recognized in the world.

The Atlantic Forest has an estimated plant diversity of about 20,000 species, and about 6000 of these are considered endemic. Biome in Rio de Janeiro State has the following formations: rainforest, rainforest with *Araucaria* Juss., seasonal forest, restinga, mangrove, and high-altitude grasslands. It is considered to be well protected in Rio de Janeiro, where there are about 42 conservation units, including national and state parks, biological reserves, ecological stations, and environmental protection areas, forming 28% of the total remnant area (Centro de Informações e Dados do Rio de Janeiro, 1995). Significant to the study of *Oxypetalum*

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R. Br. in Rio de Janeiro are the Itatiaia National Park, Serra dos Órgãos National Park, Tijuca National Park, and Restinga de Jurubatiba National Park.

These national parks play an important role in the preservation of *Oxypetalum*. Of the 25 taxa found in Rio de Janeiro, 13 are from Itatiaia National Park, nine are from Serra dos Órgãos National Park, five are from Tijuca National Park, and three are from Restinga de Jurubatiba National Park. Species of this genus, such as *O. banksii* Schult. subsp. *banksii*, occur at sea level in the restinga but are also found at high altitudes in Itatiaia National Park. In the 20th century, the spectacular flora of Rio de Janeiro encouraged researchers from the Rio de Janeiro National Museum and the Rio de Janeiro Botanical Garden Research Institute (those with the largest herbaria) to collect more intensely. Especially noteworthy collections were made by the following researchers, listed with the areas they worked in: A. C. Brade from Itatiaia and Macaé (1933–1940), P. Campos Porto from Itatiaia and Serra dos Órgãos (1918, 1925, 1934), E. Pereira from Itatiaia and Serra dos Órgãos (1943–1944), and J. G. Kuhlmann from Serra dos Órgãos (1940). These voluminous collections made possible the publication of several regional treatments of well-known Brazilian botanists, such as Barroso (1957), Brade (1957), Rizzini (1957), Pereira (1965), Albuquerque (1968), Barroso et al. (1974), and more recently, Marques et al. (1997), with other family treatments, such as Fromm-Trinta (1997) and Coelho (1997). Given the high species diversity observed in Rio de Janeiro and the large number of specimens held in local herbaria, taxonomists from this state have been collaborating toward the Programa Flora do Rio de Janeiro.

MATERIAL AND METHODS

This study is based on the examination of ca. 576 herbarium specimens from B, BHCB, BM, BOTU, CAMB, CEN, CEPEC, CTES, CVRD, ESA, ESAL, F, FCQ, G, GFJP, GUA, HB, HBR, HRB, HRCB, HUEFS, IBGE, ICB, ICN, INPA, K, M, MBM, NY, OUPR, OXF, P, PAMG, R, RB, RBR, RFA, RUSU, UB, UFG, S, SP, SPF, TER, US, W, WU. Field work was carried out in 1978 and from 2001 to 2002. The pollinaria were fixed on temporary slides with 50% water and glycerin. Measurements were made with an Olympus BH2 optical microscope.

TAXONOMY

Oxypetalum R. Br., *Asclepiadeae* 30. 1810, nom. cons. TYPE: *Oxypetalum banksii* R. Br. ex Schult.

Gothofreda Vent., *Choix* Pl. 36, t. 60. 1808. TYPE: *Gothofreda cordifolia* Vent.

Calostigma Decne., *Ann. Sci. Nat., Bot.*, ser. 2, 9: 343. 1838. TYPE: *Calostigma insigne* Decne.

Schizostemma Decne., *Ann. Sci. Nat., Bot.*, ser. 2, 9: 344. 1838. TYPE, designated here: *Schizostemma parviflora* Decne., *Ann. Sci. Nat., Bot.*, ser. 2, 9: 345. 1838. *Oxypetalum parviflorum* (Decne.) Decne., *Prodr. (DC.)* 8: 587. 1844. *Gothofreda parviflora* (Decne.) Kuntze, *Revis. Gen. Pl.* 2: 420. lit. 1891.

Pachyglossum Decne., *Ann. Sci. Nat., Bot.*, ser. 2, 9: 345. 1838. TYPE, designated here: *Oxypetalum pachyglossum* Decne., *Prod. (DC.)* 8: 585. 1844.

Bustelma E. Fourn., *Fl. Bras.* 6(4): 287. 1885. TYPE: *Bustelma warmingii* E. Fourn., *Fl. Bras.* 6(4): 288. 1885. TYPE: Brazil. Minas Gerais: Lagoa Santa, 28 Mar. 1864, *J. E. B. Warming 1862* (lectotype, designated by Fontella-Pereira & Marquete, 1971: 4, C!). [= *Oxypetalum warmingii* (E. Fourn.) Fontella & Marquete, 1971.]

Twining vine, erect, rarely decumbent; stem and branches usually pubescent to lanate, rarely glabrous or glabrescent; latex white. Leaves opposite, petiolate or $\pm$ sessile, glabrous to lanate; petiole adaxially with (0 to) 1 to 5(to 7) colleters at blade base; blades ovate to oblong-lanceolate, usually base cordate and apex acuminate, veining brochidodromous or camptobrochidodromous. Inflorescences 1 per node, extra-axillary, sciadioid, cymoid to corymbiform, dichasially sciadioid-umbelliform and dichasially sciadioid-corymbiform, usually pedunculate, bract linear to lanceolate, pedicels short or elongate. Perianth glabrous, glabrescent, or with trichomes nonglandular, uniseriate, pluricellular, smooth, or verrucose; calyx lobes basally fused, abaxially glabrous or with trichomes (1- to 10-celled) longer than trichomes of the corolla, adaxially usually glabrous, with 1 or 9 colleters below each sinus within; corolla rotate to campanulate, white, green, yellow, brown, red, or purple, lobes usually twisted, reflexed, spreading or erect, glabrous to glabrescent or densely covered with verrucose or smooth trichomes (1- to 7-celled); corona white, green, brown, yellow, purple, red, or vinaceous, fused to both the base of the staminal column and the lower part of the corolla tube, lobes simple, tooth adaxially present or absent; gynostegium sessile, $\pm$ sessile, or shortly stipitate; anthers winged, wings extending along the entire length of the anther, anther wings of adjacent anthers parallel to each other, usually longer than dorsum, with connective appendage of several shapes; corpusculum thick and linear to $\pm$ cylindrical or laminar in frontal view, usually without a membranaceous appendage at apex; caudicles horizontal, usually with teeth lateral, curved and free or descending to oblique with tooth indistinct and included, short or long-pedicellate; pollinia pendulous, or descending to oblique, longer or shorter than corpusculum, rarely equal; style-head white, purple, violet, dark red, or

vinaceous, usually elongated-conical and bifid, rarely depressed-conical to conical, usually exerted. Follicles 1 or 2 per flower, usually pedicellate and fusiform, usually smooth, glabrous to lanate; seeds verrucose and comose.

Several botanists have published important papers on *Oxypetalum* in Brazil, including Fournier (1885), Malme (1900, 1927), Hoehne (1916), Occhioni (1956), and Rapini et al. (2001). Goyder (2004), with his synopsis of the genus *Philibertia* Kunth, published a key to the genera most closely allied to *Oxypetalum*: these are *Widgrenia* Malme, *Schistogyne* Hook. & Arn., *Philibertia* Kunth, *Tweedia* Hook. & Arn., *Araujia* Brot., and *Morrenia* Lindl. A similar key was published by Krapovickas and Cáceres-Moral (1990).

Oxypetalum is found in the Neotropics and in subtropical regions stretching from Mexico to Argen-

tina, with ca. 130 species (Rapini et al., 2003). In Brazil, there are about 110 known taxa. In Rio de Janeiro, these occur in low-montane rainforest, montane rainforest, high-altitude grasslands, and restinga, but in other states they also occur in gallery forest, rainforest with *Araucaria*, secondary forest, open secondary vegetation, seasonal forest, disturbed seasonal forest cerrado, cerrado-cerradão, cerrado, campo, and campo rupestre.

Lectotypifications of *Schizostemma* Decne. and *Pachyglossum* Decne. are necessary because there is no indication of type in the protologue. Of the five species described for the genus *Pachyglossum*, *Oxypetalum pachyglossum* Decne. is selected, and of the 10 species described for the genus *Schizostemma*, *Schizostemma parviflora* Decne. (= *Oxypetalum parviflorum* (Decne.) Decne.) is selected.

KEY FOR THE SPECIES OF *OXYPETALUM* IN RIO DE JANEIRO, BRAZIL

- 1a. Corpusculum with membranaceous appendage at apex 2. *O. appendiculatum*
- 1b. Corpusculum without membranaceous appendage at apex.
 - 2a. Style-head usually crateriform or coroniform at apex or from the middle, usually elongate and exerted, more rarely laciniate or bifid, in this case with branches laminar or planar.
 - 3a. Corpusculum slightly longer than pollinia; caudicles with included teeth 6. *O. costae*
 - 3b. Corpusculum conspicuously longer than pollinia; caudicles with free teeth.
 - 4a. Corona lobes trullate or $\pm$ trullate; corpusculum $\pm$ claviform 18. *O. regnellii*
 - 4b. Corona lobes $\pm$ rectangular, rectangular or oblong; corpusculum linear, rectangular-elongate, oblong and laminar.
 - 5a. Leaf blades pubescent, tomentose, woolly or tawny-tomentose.
 - 6a. Style-head usually crateriform or coroniform at apex or up the middle
. 9a. *O. insigne* var. *insigne*
 - 6b. Style-head, bifid to middle, 2 branchlets divaricate or lanceolate.
 - 7a. Leaves adaxially pubescent, abaxially tomentose; caudicles appressed at base of the corpusculum; pollinia 3 to 4 $\times$ shorter than corpusculum
. 19. *O. schottii*
 - 7b. Leaves tawny-tomentose to woolly; caudicles not appressed at base of the corpusculum; pollinia to 2 $\times$ shorter than corpusculum or equal or approximately equal in size to corpusculum.
 - 8a. Leaf blades abaxially whitish lanose; corolla lobes reflexed, with smooth trichomes; corona lobes 1.8–2 $\times$ 1.3–1.8 mm, adaxially with tooth reaching up to middle of the corona lobe; corpusculum 0.90–0.99 $\times$ 0.26–0.30 mm, ossiform, thickened in lateral view, not laminar, curved; pollinia equal or approximately equal in size of corpusculum 15. *O. pannosum*
 - 8b. Leaf blades abaxially fulvous-woolly; corolla lobes spreading, with verrucose trichomes; corona lobes 3–4.5 $\times$ 1.5–2 mm, tooth adaxially present, longer than corona lobe; corpusculum 1.10–1.20 $\times$ 0.30–0.35 mm, linear or oblong, thin, laminar, planar; pollinia 2 $\times$ shorter than corpusculum 11. *O. lanatum*
 - 5b. Leaf blades glabrous, glabrescent, or puberulent.
 - 9a. Corolla lobes adaxially glabrous; corpusculum 1.53–1.83 mm; style-head usually with planar apex shell-shaped or bifid with branches divaricate or erect
. 9b. *O. insigne* var. *glabrum*

- 9b. Corolla lobes adaxially sparsely pubescent; corpusculum 1.23–1.35 mm; style-head usually planar with 2 branches trilobate at apex 9c. *O. insigne* var. *glaziovii*
- 2b. Style-head usually elongate, exserted, in this case bifid and with branches linear or filiform, thick or not, rarely included or shortly exserted, $\pm$ entire, emarginate.
- 10a. Style-head included or shortly exserted.
- 11a. Leaves glabrous; corolla lobes spreading; peduncle 16–53(81) mm; corpusculum erect in side view, thick, not laminar; caudicles descending, with teeth included 14. *O. pachyglossum*
- 11b. Leaves adaxially lanose or pubescent, abaxially lanose; corolla lobes reflexed; peduncle 0.4–1.5 mm, corpusculum curved in side view, not thick, laminar; caudicles horizontal, with teeth curved and free 20. *O. sublanatum*
- 10b. Style-head usually elongate and exserted.
- 12a. Caudicles with teeth included.
- 13a. Corona lobes adaxially without tooth; anther wings shorter than the dorsum; caudicles descending or oblique; style-head bifid or $\pm$ entire, usually twisted 1a. *O. alpinum* var. *alpinum*
- 13b. Corona lobes adaxially with tooth; anther wings longer than the dorsum; caudicles horizontal or $\pm$ horizontal; style-head bifid or bilobate and not twisted.
- 14a. Decumbent shrub; corona adaxially with an inconspicuous tooth; caudicles broad and planar; style-head bifid from the middle 16. *O. patulum*
- 14b. Twining vine; corona adaxially with a conspicuous tooth; caudicles filiform; style-head bifid or bilobate at apex 8. *O. glaziovii*
- 12b. Caudicles with teeth free and usually curved.
- 15a. Pollinia sigmoid, thin at tip.
- 16a. Corona enclosing only partially the connective appendage of the anthers; corpusculum curved in lateral view, abaxially with the split broad at apex; found along the Brazilian coast in restingas, disturbed forest, and secondary rainforest, from sea level to 1800 m elevation 4a. *O. banksii* subsp. *banksii*
- 16b. Corona enclosing the connective appendage of the anthers; corpusculum erect or suberect in lateral view, abaxially with the split narrow at apex; found only in restingas from Rio de Janeiro, usually at sea level 4b. *O. banksii* subsp. *corymbiferum*
- 15b. Pollinia cylindrical, oblong or $\pm$ elliptical, rounded at tip.
- 17a. Corpusculum laminar, usually thin.
- 18a. Corolla lobes adaxially verrucose or papillose-verrucose . . . 13. *O. molle*
- 18b. Corolla lobes adaxially puberulent, rarely $\pm$ glabrous.
- 19a. Corolla lobes linear-oblong; corona lobes rotund or $\pm$ rhomboidal; corpusculum 3 $\times$ longer than the pollinia 7. *O. glaziovianum*
- 19b. Corolla lobes linear-lanceolate or $\pm$ linear; corona lobes flabellate; corpusculum less than 2 $\times$ longer than pollinia.
- 20a. Calyx lobes with 1 colleter below each sinus within; corona lobes adaxially always lacking tooth; caudicles long-stipitate 5a. *O. cordifolium* subsp. *brasiliense*
- 20b. Calyx lobes with fascicle of collaters below each sinus within; corona lobes adaxially with tooth; caudicles short-stipitate 5b. *O. cordifolium* subsp. *pedicellatum*
- 17b. Corpusculum linear or $\pm$ oblong, usually thick.
- 21a. Corolla lobes very elongate, 25–34 mm 3. *O. arachnoideum*
- 21b. Corolla lobes short, 4.5–15 mm.
- 22a. Corolla rotate; corona lobes $\pm$ rhombic, adaxially tooth absent 17. *O. pilosum*
- 22b. Corolla campanulate or $\pm$ campanulate; corona lobes oblong, $\pm$ rectangular, $\pm$ oblong, trilobate, adaxially with tooth present or process thickened, rounded or heart-shaped.

- 23a. Corona lobes oblong, ± oblong, ± rectangular or rectangular, adaxial tooth linear or filiform; style-head very elongate, 9–11 mm.
- 24a. Corolla tube glabrous at throat; corona with adaxial tooth surpassing tip of corona lobe; corpusculum as long as pollinia 12. *O. lutescens*
- 24b. Corolla tube barbellate at throat; corona with adaxial tooth not reaching tip of corona lobe; corpusculum longer than pollinia 10. *O. jacobinae*
- 23b. Corona lobes trilobate with adaxial process thickened, heart-shaped or rounded; style-head shortly elongate, 4–6 mm 21. *O. wightianum*

- 1. ***Oxypetalum alpinum*** (Vell.) Fontella & E. A. Schwarz, Bol. Mus. Bot. Munic. 61: 2. 1984. *Asclepias alpina* Vell., Fl. Flumin. [Text]: 116. 1829. TYPE: Brazil. plate 57, J. M. C. Vellozo, Fl. Flumin. Icones 3, 57. 1831 (lectotype, designated by Fontella-Pereira & Schwarz, 1984a: 2, pl. 57).
- 1a. ***Oxypetalum alpinum*** (Vell.) Fontella & E. A. Schwarz var. ***alpinum***. *Asclepias nitida* Vell., Fl. Flumin. [Text]: 116. 1829. TYPE: Brazil. pl. 59, J. M. C. Vellozo, Fl. Flumin. Icones 3: 59. 1831 (lectotype, designated by Fontella-Pereira & Schwarz, 1984a: 2, pl. 59).

Oxypetalum umbellatum Gardner in Hook., London J. Bot. 1: 179. 1842. *Gothofreda umbellata* (Gardner) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. “dry bushy places at Rio Comprido, near Rio de Janeiro,” s.d., G. Gardner 77 (holotype, K!).

Oxypetalum umbellatum var. *puberulum* Hoehne, Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas 38(1): 20. 1916. TYPE: Brazil. *Herbário RB* 2490 (holotype, RB!).

Twining vine, branches glabrescent. Leaves with petiole 1–2 cm, pubescent, with 4 colleters at blade base; blades 5.2–6.5 × 1.3–2.1 cm, narrowly oblong to lanceolate, brochidodromous, basally cordate, apically acuminate, adaxially glabrous or glabrescent, abaxially puberulent. Inflorescence 12- to 14-flowered, sciadioid; peduncle (0.4)1–2.7 cm, pubescent; pedicels 5–10 mm, pubescent. Floral buds 0.6–0.8 cm, conical; calyx lobes 1.5–3 × 0.4–1 mm, with 1 colleter below each sinus within, lanceolate, glabrous outside, pubescent within, with smooth trichomes; corolla tubular to narrowly campanulate, tube 2–2.5 mm, pubescent outside, glabrous inside, lobes 4.5–6.5 × 0.6–2 mm, linear-lanceolate to lanceolate, spreading and twisted at apex, abaxially pubescent, adaxially barbellate at base and papillose on the central, apical, and lateral parts, with smooth trichomes (68)96–138(276) μm; corona lobes 3.5–4.5 × 1.2–1.5 mm, linear-oblong to rectangular, usually exerted and obscuring the anthers, with emarginate

or truncate apex, tooth adaxially absent; gynostegium 1–1.5 mm high, ± sessile; anthers ± triangular, with wings 0.6–0.9 mm, shorter than dorsum; connective appendage 0.5–0.6 mm, ovate; corpusculum 0.3–0.4 × 0.1–0.12 mm, oblong or elliptical, thin, not laminar and planar; caudicles 0.1–0.2 mm, descending or oblique, fixed on base of corpusculum, shortly stipitate, teeth indistinct and included; pollinia 0.44–0.6 × 0.16–0.18 mm, oblong to ± elliptical, slightly longer than corpusculum; style-head 3.5–8 mm, cylindrical, elongate and exerted, bifid or ± entire, usually twisted. Follicle 7–8.2 × 0.9–1.2 cm, fusiform, with acuminate tip, glabrescent to tomentose; seeds 6–7.5 × 2.8–3 mm, ovate, slightly verrucose, coma 2.5–3 mm.

Phenology. Collected in flower from January to December; in fruit in February, April, June, and December.

Distribution. Brazil: Espírito Santo, Minas Gerais, and Rio de Janeiro.

Oxypetalum alpinum is usually found in seasonal wetlands from restinga, restinga forest, and secondary Atlantic rainforest from sea level to 790 m in Brazil. *Oxypetalum alpinum* var. *alpinum* is quite similar to *O. pachyglossum* in lamina shape and overall appearance. The taxa are distinguished by the campanulate corolla with the tube adaxially glabrous of *O. alpinum* var. *alpinum* (vs. the corolla with the tube adaxially barbellate of *O. pachyglossum*) and by the style-head longer and exerted of the former (vs. the style-head shorter and usually included of the latter).

Specimens examined. BRAZIL. **Espírito Santo:** Linhares, Res. Flor. Cia. Vale do Rio Doce, *Martinelli et al.* 1861 (RB). **Minas Gerais:** Marliéria, Parq. Est. Rio Doce, Lagoa Carioca, *Lombardi* 1289 (BHCB). **Rio de Janeiro:** Angra dos Reis, Ilha Grande Res. Biol. Est. Praia do Sul, *Araujo et al.* 6699 (GUA); Angra dos Reis, *Brade* 20515 (RB); Barra do Piraí, Ipiabas, *Laclette s.n.* (R-37324); Campos dos Goytacazes, Lagoa da Saudade, *Araujo* 4557 & *Maciel* (GUA); Campos dos Goytacazes, Lagoa das Pedras,

Pedrosa 841 & Casari 942 (GUA); Carapebus, Carapebus, *Konno 607* (SP); Praia de Carapebus, *Lima 676* (RB); Itatiaia, *Markgraf & Brade 21252* (RB); Magé, Cachoeiras de Macacú, Res. Ecol. Est. Paraíso, Faz. Curtume Carioca, Pedra Ferro, *Vaz 959* (RB); Magé, Polder de Pilar, *Lutz 1541* (R); Maricá, *Souza et al. 1990* (R); Amil, *Pereira 648* (HB, RB); Natividade, Caiçaras, *Duarte 1116* (RB); Passa Tres, *Mello s.n.* (RB-10556, RFA); Petrópolis, Mata do Judeo, Petrópolis, *Sucre 4241 & Braga 1198* (RB); Rio de Janeiro, *Saint-Hilaire catal. B2, n.14* (F); Baixada de Jacarepaguá, Lagoa de Marapendi, *Araujo 5427* (GUA, NY); Santa Maria Madalena, Estação de Desengano, Faz. Sta. Monica, *Occhioni 1177* (RB); Silva Jardim, Res. Biol. Poço das Antas, *Araujo 4011* (GUA); Silva Jardim, *Lima et al. 4580* (RB); Teresópolis, Faz. Comary, *Occhioni 1282* (F, RB). State not known, *Schott 5385* (B, NY).

- 2. *Oxypetalum appendiculatum*** Mart., Nov. Gen. Sp. Pl. 1: 48, t. 30. 1824. *Gothofreda appendiculata* (Mart.) Kuntze, Revis. Gen. Pl. 2: 419. 1891. TYPE: Brazil. Minas Gerais: "habitat inter frutices prope Lagoa Dourada inter S. João d El Rey et Villam Ricam alibique in montosis," s.d., *C. F. P. von Martius s.n.* (holotype, M!).

Oxypetalum siliculae E. Fourn., Fl. Bras. 6(4): 266. 1885. *Gothofreda siliculae* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. São Paulo: "ad S. Carlos, Januario," *L. Riedel 2189*, p.p. (holotype, L.E!).

Twining vine, branches tomentose to pubescent. Leaves with petiole 1–4 cm, tomentose, with 4 colleters at blade base; blades (3)5–10.8(13) × 2.2–4.5(5) cm, oblong to ovate-lanceolate, camptobrochidodromous, basally cordate, apically acuminate, adaxially tomentose to pubescent, abaxially tomentose. Inflorescence 1- to 8-flowered, sciadioid; peduncle 4–21 mm, tomentose; pedicels 3.6–14 mm, tomentose to pubescent, 1- or 3-bracteolate. Floral buds 1.3–1.7 cm, ovate; calyx lobes 4.5–11 × 0.5–0.7 mm, with 2 or 3 colleters below each sinus within, linear to linear-lanceolate, pubescent outside, glabrous inside, with verrucose trichomes 71–112 µm; corolla campanulate, tube 4–7 mm, pubescent outside, puberulent inside, lobes 11–24 × 2.5–4 mm, triangular-elongate, usually erect and abaxially pubescent to tomentose, adaxially glabrous and slightly verrucose at throat, with verrucose trichomes 33–34 µm; corona lobes 2.5–3 × 2–2.2 mm, ovate-rectangular to oblong, obscuring the anthers, tooth adaxially absent; gynostegium 2.5–3 mm high, inside the corolla tube, sessile; anthers trapezoidal, with wings 0.5–1 mm, longer than dorsum; connective appendage 1.5–1.7 mm, cordiform to triangular; corpusculum 0.84–0.92 × 0.10–0.12 mm, in frontal view, with a membranaceous appendage rounded at apex, thick, not laminar, planar, ± linear; caudicles 0.24–0.34 mm, horizontal, with teeth lateral, curved

and free, shortly stipitate; pollinia 0.56–0.66 × 0.14–0.16 mm, oblong, equal or slightly longer than corpusculum; style-head 10–11 mm, bifurcate in filiform, erect branches. Follicle 6.1–9.8 × 0.9–1.3 cm, ovate to fusiform, tomentose; seeds 5–5.9 × 3–4 mm, ovate, coma 2–2.5 cm.

Phenology. Collected in flower the entire year; in fruit from January to June and August to November.

Distribution. Brazil: Mato Grosso, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo. Also in Argentina, Bolívia, Paraguay, and Uruguay (Fontella-Pereira et al., 2004).

Oxypetalum appendiculatum is found in rainforest, secondary rainforest, gallery forest, and high-altitude grasslands in Rio de Janeiro. In other Brazilian states, it occurs in rainforest, rainforest with *Araucaria*, open secondary vegetation, seasonal forest, disturbed seasonal forest, cerrado, cerrado-cerradão, cerrado, campo rupestre, and grasslands campo from 200 to 1821 m. It is the most distinctive *Oxypetalum* species from Brazil and has the gynostegium inside the corolla tube, the lobes erect, and the corpusculum with a membranaceous appendage rounded at its apex.

Specimens examined. BRAZIL. **Minas Gerais:** Ouro Preto, Camarinhas, *Marquete et al. 293* (R, RB). **Paraná:** Guarapuava, Lagoa Sêca, *Hatschbach 19783 & Guimarães* (MBM, RFA, S). **Rio de Janeiro:** Itatiaia, Parq. Nac. Itatiaia, *Occhioni 1223* (RB); Itatiaia, Monteserrat, *Porto 1023* (RB); Nova Friburgo, Pico Nova Caledônia, *Lima et al. 2529* (INPA, NY, RB); Petrópolis, Araras, Vale da Cachoeira, *Ferreira 1085* (RB); Petrópolis, Serra das Araras, *Occhioni 1493* (RFA); Teresópolis, Condomínio Comary, Alfredo de Carvalho, *Marquete et al. 436* (R, RB); Teresópolis, Posse, Morro das Antenas de Televisão, *Sucre 2300 & Braga 143* (RB); **Rio Grande do Sul:** Porto Alegre, Chácara do Mostardeiro, Moinhos de Vento, *Pabst 5727* (HB). **Santa Catarina:** São Joaquim, Bom Jardim, Faz. Laranja, *Reitz & Klein 8190* (HBR). **São Paulo:** São José do Barreiro, Bocaina, *Rapini & Carvalho 931* (SPF). State not known: "Ex Herb. brasil. Regnelli" (S).

- 3. *Oxypetalum arachnoideum*** E. Fourn., Fl. Bras. 6(4): 272. 1885. *Gothofreda arachnoidea* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 419. 1891. TYPE: Brazil. "ad Rio de Janeiro," s.d., *A. F. M. Glaziou 14091* (holotype, P!; isotypes, B!, R!, B photo at F!, HB!, RB!).

Oxypetalum grandiflorum E. Fourn., Fl. Bras. 6(4): 272. 1885. *Gothofreda grandiflora* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. São Paulo: "in capoeiras," s.d., *A. F. C. P. St.-Hilaire Cat. B1 n. 1507* (lectotype, designated by Fontella-Pereira, 1970: 2, P!, P photo at K!, RB!; isotype, P fragment at F!).

Twining vine, branches tomentose. Leaves with petiole 3.7–3.8 cm, pubescent to tomentose, with 3 or 4 colleters at blade base; blades 5.8–6.5 × 3.9–4.2 cm, brochidodromous, basally cordate, apically

acuminate or caudate, adaxially sparsely pubescent, abaxially pubescent. Inflorescence usually ca. 3-flowered, dichasial to sciadioidal-corymbiform; peduncle 3.5–5.4 cm, pubescent to tomentose; pedicels 19–25 mm, pubescent to tomentose, 2- or 3-bracteolate. Floral buds 1.8–3 cm, ovate-lanceolate; calyx lobes $4.2\text{--}4.8 \times 0.8\text{--}1$ mm, with 3 colleters below each sinus within, linear to lanceolate, pubescent to tomentose outside, glabrous inside, with smooth trichomes $105\text{--}148\ \mu\text{m}$; corolla tube 3–5 mm, shortly campanulate, puberulent to glabrate outside, glabrous inside, enclosing the anthers, lobes $25\text{--}34 \times 2\text{--}2.4$ mm, linear, very elongate, spreading, abaxially puberulent to $\pm$ glabrate, with smooth trichomes, adaxially glabrous; corona lobes $2.2\text{--}3.5 \times 2.2\text{--}2.5$ mm, oblong to rectangular, apex truncate or undulate, slightly longer than anthers, tooth adaxially absent; gynostegium 4–4.5 mm high, $\pm$ sessile; anthers $\pm$ trapezoidal, with wings 1–1.2 mm, longer than dorsum; connective appendage 1.2–1.5 mm, ovate; corpusculum $1.36\text{--}1.81 \times 0.08\text{--}0.21$ mm, linear in frontal view, thick, not laminar; caudicles 0.11–0.34 mm, horizontal, with teeth lateral, curved and free, shortly stipitate, inserted $\pm$ basally at corpusculum; pollinia $0.73\text{--}0.89 \times 0.10\text{--}0.31$ mm, oblong, shorter than corpusculum; style-head 7–7.5 mm, elongate and exserted, bifid from the middle, with filiform branches usually twisted. Fruit not seen.

Phenology. Collected in flower from March to April.

Distribution. Brazil: Bahia (Fontella-Pereira et al., 1989), Minas Gerais, Rio de Janeiro, and São Paulo.

Oxypetalum arachnoideum is found in secondary rainforest in Rio de Janeiro growing at 50 to 200 m and in gallery forest in Minas Gerais (Rapini et al., 2001). In Bahia it was collected in rocky thickets and along watercourses at ca. 1000 m. This species is readily recognized by its lobes that are rather elongate and usually twisted, corona with tooth adaxially absent, and style-head elongate with branches usually twisted. It is quite similar to *O. banksii* subsp. *banksii* in overall appearance. However, it differs from this taxon principally in its inflorescence being dichasial to sciadioidal-corymbiform (vs. cymoid to corymbiform), corolla lobes 25–34 mm (vs. 14–25 mm), and style-head bifid from the middle with twisted branches (vs. bifid from the middle with erect or divaricate branches).

Specimens examined. BRAZIL. **Bahia:** Serra Geral de Caitité, Caitité, Brejinhos das Ametistas, *Harley 21204* (K, RB). **Rio de Janeiro:** Niterói, Morro Cavalão, *Brade 10402* (F, R, S); Rio de Janeiro, Silvestre, Estrada Nova, *Duarte 4774 & Pereira* (F, HB, RB, RFA); Rio de Janeiro, Novo Mundo, *Kuhlmann 16349* (S, SP); Rio de Janeiro, Corcovado, *Ule s.n.* (R).

4. *Oxypetalum banksii* R. Br. ex Schult., Syst. Veg. ed. 15 bis [Roemer & Schultes] 6: 91. 1820. *Gothofreda banksii* (Schult.) Kuntze, Revis. Gen. Pl. 2: 419. 1891. TYPE: Brazil. Rio de Janeiro: *J. Banks & D. C. Solander 1768* (holotype, BM!, BM photo at RB!).

4a. *Oxypetalum banksii* subsp. *banksii* Schult. *Asclepias communis* Vell., Fl. Flumin. [Text]: 115. 1829. TYPE: pl. 53, J. M. C. Vellozo, 1831 (lectotype, designated by Rapini et al., 2001: 90, pl. 53 in Vellozo, 1831).

Oxypetalum maritimum Hook. & Arn., J. Bot. (Hooker) 1: 288. 1834. *Gothofreda maritima* (Hook. & Arn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Bahia: “in maritimis [as *Apocynum maritimum*] of *Salzmann’s Herb. Brasil. 329*” (holotype, K!; isotype P!, P photo at RB!).

Twining vine, branches pubescent to tomentose. Leaves with petiole 0.6–6.3 cm, pubescent to tomentose, with ca. 4 colleters at blade base; blades $2.5\text{--}12.4 \times 1.3\text{--}9.5$ cm, ovate to oblong, rarely $\pm$ rotund, camptobrochidodromous, basally cordate or auriculate, apically acuminate or acute, adaxially glabrescent to sparsely pubescent, abaxially pubescent to tomentose. Inflorescence 1- to 12-flowered, cymoid to corymbiform; peduncle 0.3–5 cm, pubescent to tomentose; pedicels 10–20 mm, usually pubescent, 2- or 3-bracteolate. Floral buds 1.0–1.5 cm, conical; calyx lobes $3\text{--}4 \times 1.0\text{--}1.5$ mm, with 1 or 3 colleters below each sinus within, rarely colleters absent, linear-lanceolate or triangular-elongate, pubescent to tomentose outside, glabrescent inside, smooth trichomes $91\text{--}288\ \mu\text{m}$; corolla rotate to campanulate, tube 1.8–2.0 mm, puberulent outside, pubescent to tomentose within, lobes $14\text{--}25 \times 2.0\text{--}3.0$ mm, linear-lanceolate, reflexed and usually twisted at apex, abaxially pubescent to tomentose, adaxially puberulent to slightly papillose, with smooth trichomes $(51)83\text{--}149\ \mu\text{m}$; corona lobes $2.8\text{--}3.0 \times 2.2\text{--}2.5$ mm, spathulate to oblong-spathulate, truncate to rounded and wrinkled at apex, exserted, sometimes reflexed, enclosing only partially the connective appendage of the anthers, tooth adaxially absent; gynostegium 2.3–2.5 mm high, sessile; anthers $\pm$ trapezoidal, with wings 1.6–2 mm, longer than dorsum; connective appendage 2–2.5 mm, ovate, exserted, higher than corona lobes; corpusculum $1.55\text{--}1.76 \times 0.26\text{--}0.30$ mm, $\pm$ claviform in frontal view with split broad at apex, curved in lateral view, thick, not laminar; caudicles 0.26–0.30 mm, horizontal, with teeth lateral, curved and free, shortly stipitate, inserted $\pm$ basally at corpusculum; pollinia $1.14\text{--}1.33 \times 0.19\text{--}0.22$ mm, sigmoid, thin at tip, usually shorter than corpusculum; style-head 0.5–1.5 mm, conical at base, elongate and exserted, bifid

from the middle, with filiform, erect or divaricate branchlets. Follicle $6.4\text{--}7.4 \times 0.9\text{--}1.5$ cm, fusiform, glabrous, with acuminate tip; seeds $5.5\text{--}6 \times 2.8\text{--}3$ mm, ovate, coma 2–2.5 cm.

Phenology. Collected in flower from January to December; in fruit from January to September.

Distribution. Brazil: Alagoas (Fontella-Pereira et al., 2004), Bahia, Espírito Santo, Minas Gerais, Paraná (Fontella-Pereira et al., 2004), Rio de Janeiro, Rio Grande do Sul (Fontella-Pereira et al., 2004), Santa Catarina, and São Paulo.

In Brazil, *Oxypetalum banksii* is found along the coast, usually in restingas, disturbed forest, and secondary rainforest from sea level to 1800 m. This species is readily recognized by its corolla lobes reflexed and usually twisted at the apex, corona lobes not enclosing the gynostegium and exserted, tooth adaxially absent, and sigmoid pollinia. The subspecies is quite similar to *O. arachnoideum* in overall appearance. However, it differs from this species principally in its inflorescences being cymoid to corymbiform (vs. dichasial to sciadioid-corymbiform), corolla lobes 14–25 mm (vs. 25–34 mm), and style-head bifid from the middle with erect or divaricate branches (vs. bifid from the middle with usually twisted branches).

Specimens examined. BRAZIL. **Bahia:** Vale do Rio Mucuri, BR 101, *Belém* 3885 (NY). **Espírito Santo:** Guarapari, *Occhioni* 7219 (RFA). **Minas Gerais:** Caratinga, Est. Biol. Caratinga, Faz. Montes Claros, Rafael, *Lombardi* 3675 (BHCB). **Rio de Janeiro:** Angra dos Reis, Ilha Grande, Res. Biol. Est. Praia do Sul, *Araujo et al.* 5699 (GUA); Araruama, near Lagoa Vermelha, *Araujo* 2127 & *Maciel* (GUA); Arraial do Cabo, Res. Ecol. Est. Massambaba, near Lagoa Salgada, *Araujo* 8713 & *Maciel* (GUA); Barra do Piraí, Ipiabas and Faz. Prosperidade, *Carauta* 5276 & *Peixoto* 492 (GUA); Búzios, Armação dos Búzios, restinga da Faz. Junqueira, Rasa, *Martinelli et al.* 1167 (RB); Cabo Frio, Rio Una, *Araujo* 5632 (GUA); Campos dos Goytacazes, *Vianna et al.* 1383 (GUA); Casimiro de Abreu, betw. Barra de São João–Rio das Ostras, *Martinelli et al.* 5669 (NY); Cordeiro, Santa Maria Madalena, em direção à estrada para Bonsucesso, *Klein et al.* 742 (RB); Duque de Caxias, Res. Petrobras, Largo do Sangradouro, *Silva Neto et al.* 14000 (RB); Itatiaia, Parq. Nac. Itatiaia, *Braga* 2899 (RB); Macaé, Frade to Usina Elétrica, *Marquete* 407 (RB); Magé, Piabetá, Km 135 da Rodovia Rio–Teresópolis, Parq. Estrela, Portinho, *Giordano* 1685 (RB); Maricá, Barra de Maricá, *Lewinson & Monteiro* 18122 (UB); Mendes, *Vidal s.n.* (R); Resende-Formoso, Resende, *Pirani* 2907 & *Mello Silva* (NY); Niterói, Itaipu, *Santos* 2456, *Fromm Trinta* 2349, *Sacco* 2551 (R); Parati, Sono, *Marquete, R.* 416 (HRB, RB); Paracambi, *Carauta et al.* 6380 (GUA); Petrópolis, Araras, Vale das Videiras, Miguel Pereira, *Marquete et al.* 286 (R, RB); Quissamã, Visqueiro, *Marquete et al.* 403 (R, RB); Rio Bonito, *Occhioni* 3858 (RFA); Rio das Ostras, Praia do Norte, *Marquete et al.* 323 (R, RB); Rio de Janeiro, Praia de Sernambetiba, Recreio dos Bandeirantes, *Smith et al.* 6340 (R); Rio de Janeiro, Pão de Açúcar, *Carauta et al.* 3420 (GUA); São João da Barra, Silva Jardim-Araruama, *Fromm*

1321, *Santos* 1343, *Trinta* 247 (R); Saquarema, Sambaqui da Beirada, *Araujo* 8078 (GUA); Silva Jardim, Res. Biol. Poços das Antas, Faz. Portuense, *Martinelli* 8463 & *Lima* (RB). **Santa Catarina:** Itajaí, Cabeçudos, *Occhioni* 3491 (RFA). **São Paulo:** Ubatuba, Rio Acaraú, 8 km S of Inst. Oceanográfico, *Fontella* 77 & *Moura* (HRCB, SP).

4b. *Oxypetalum banksii* subsp. *corymbiferum* (E. Fourn.) Fontella & C. Valente, *Anais Acad. Brasil. Ci.* 43(1): 177. 1971. *Oxypetalum corymbiferum* E. Fourn., *Fl. Bras.* 6(4): 267. 1885. *Gothofreda corymbifera* (E. Fourn.) Kuntze, *Revis. Gen. Pl.* 2: 419. 1891. TYPE: Brazil. Rio de Janeiro, A. F. C. P. *St.-Hilaire* 212 (holotype P!, P photo at RB!).

Oxypetalum schenckii K. Schum., *Bot. Jahrb. Syst.* 25(60): 20. 1898. TYPE: Brazil. "in Brasiliae civitate Rio de Janeiro prope Cabo Frio in formatione Restinga dicta scandens," *H. Schenck* 3809 (lectotype, designated by Fontella et al., 1971: 12, B not seen, B photo at RB!). *Oxypetalum marambaense* Occhioni, *Leandra* 1(1): 7, pl. 1. 1971. TYPE: Brazil. "in Brasiliae in civitate Rio de Janeiro, formatione Restinga dicta Marambaia," 20 Jan. 1970, *P. Occhioni* 4184 (holotype, RFA 9550!).

Twining vine, branches tomentose to pubescent. Leaves with petiole 0.5–3.8 cm, pubescent to tomentose, with 4 colleters at blade base; blades $2.5\text{--}6.8 \times 1\text{--}5$ cm, ovate, ovate-oblong, camptobrochidodromous, apically acuminate or mucronate, basally cordate, abaxially pubescent, adaxially tomentose to pubescent. Inflorescence 4- to 19-flowered, cymoid to corymbiform; peduncle 2–23 cm, tomentose; pedicels 10–16 mm, tomentose or pubescent, 2- or 3-bracteolate. Floral buds 0.6–0.9 cm, ovate with apical elongations; calyx lobes $2\text{--}2.5 \times 0.7\text{--}0.9$ mm, with 1 colleter below each sinus within, linear-lanceolate or triangular-lanceolate, abaxially pubescent, adaxially glabrous at base to slightly puberulent toward apex, with verrucose trichomes $79\text{--}201\text{ }\mu\text{m}$; corolla rotate to campanulate, tube 1.5–1.7 mm, pubescent or tomentose outside, papillose to puberulent within, with 5 concavities inside at base, lobes $8\text{--}16 \times 2.5\text{--}3$ mm, linear-lanceolate, acute or obtuse at apex, reflexed, spiralled, abaxially pubescent, adaxially puberulent or papillose, with verrucose trichomes $(41)67\text{--}118\text{ }\mu\text{m}$; corona lobes $2.5\text{--}4.5 \times 1.5\text{--}2$ mm, oblong to $\pm$ spatulate, ovate-oblong or $\pm$ ovate, truncate to rounded at apex, exserted, forming a fleshy and inconspicuous protuberance at junction of basal corona and staminal column, tooth adaxially absent enclosing the connective appendage of the anthers; gynostegium 2.2–2.6 mm high, sessile; anthers $\pm$ rectangular, with wings 2.3–2.7 mm, usually equal to the dorsum; connective appendage 1.3–1.5 mm, ovate, usually enclosed by the corona; corpusculum $1.06\text{--}1.65 \times 0.12\text{--}0.22$ mm, in frontal view linear to

± linear, with narrow split at apex, ± erect in lateral view, thick, not laminar, curved; caudicles 0.26–0.34 mm, horizontal, shortly pedicellate, inserted ± basally at corpusculum, with teeth lateral, curved and free, pollinia $0.94\text{--}1.17 \times 0.12\text{--}0.22$ mm, sigmoid, thin at tip, usually shorter than corpusculum; style-head 1.8–2 mm, conical at base, elongate and exserted, usually bifid from the middle, with filiform, erect or divaricate branchlets. Follicle $6.3\text{--}8 \times 1.1\text{--}1.5$ cm, fusiform or ovate, with acuminate tip, glabrous or puberulent; seeds $4.5\text{--}6 \times 1.3\text{--}2.5$ mm, ovate, subovate, coma 3–3.5 mm.

Phenology. Collected in flower from January to December; in fruit in May and from August to November.

Distribution. Brazil: Rio de Janeiro.

Oxypetalum banksii subsp. *corymbiferum* is endemic to Rio de Janeiro, growing in open restinga, usually at sea level. It is quite similar to the typical subspecies in its lamina shape, reflexed corolla lobes, and sigmoid pollinia. These taxa are usually distinguished by the corona including entirely or partially the membranaceous appendages of the anthers (vs. corona not included and the membranaceous appendage exserted in subsp. *banksii*).

Specimens examined. BRAZIL. **Rio de Janeiro:** Araruama, Zacara, Brejo do Espinho, *Araujo et al.* 5125 (GUA); Arraial do Cabo, Figueiras, Arraial do Cabo, *Marquete et al.* 320 (R, RB); Cabo Frio, Restinga de Massambaba, Figueiras, *Marquete et al.* 139 (HRB, RB); Cabo Frio–Arraial do Cabo, Iguaba, Cabo Frio, *Fontella* 2263 (NY, RB); Campos dos Goytacazes, Praia de São Tomé, *Araujo* 7100 & *Maciel* (GUA); Maricá, barra de Maricá, *Landrum* 4171 (NY); Rio das Ostras, Mar do Norte, Km 106, Rodovia RJ, *Marquete et al.* 385 (RB); Rio de Janeiro, Baixada de Jacarépagua, Parq. Mansões, *Araujo* 7836 & *Pereira* (GUA); Recreio dos Bandeirantes, 3 km N of Sernanbetiba, *Fontella et al.* 409 (RB); São João da Barra, Gruaí, *Rocha et al.* 869 (GUA); Saquarema, Res. Ecol. Est. Jacarepiá, *Konno* 470 (SP).

5. *Oxypetalum cordifolium* (Vent.) Schltr., *Symb. Antil.* 1(2): 269. 1899. *Gothofreda cordifolia* Vent., *Choix Pl.* 36: t. 60. 1808. TYPE: Paris. tab 60 in Ventenat, *Choix Pl.*, 1899 (lectotype, designated by Fontella-Pereira et al., 2005: 104).

5a. *Oxypetalum cordifolium* subsp. *brasiliense* (Decne.) Fontella & Goyder, *Kew Bull.* 60(1): 108. 2005. *Oxypetalum riparium* var. *brasiliense* Decne., *Prodr. (DC.)* 8: 583. 1844. TYPE: Brazil. Minas Gerais: “in Brasiliae sylvis caldasis inter virgulta, prope praesidium S. João-Baptista,” C. F. P. Martius 1078 (holotype, M!, M photo at K!). Figure 1.

Oxypetalum subriparium Malme, *Ark. Bot.* 25A(7): 14, fig. 8. 1932. TYPE: Brazil. Minas Gerais: Viçosa, 28 Mar.

1839, *Ynes Mexia* 4527 (holotype S!; isotype K! [specimen on righthand sheet]).

Twining vine, branches puberulent to glabrescent. Leaves with petiole 1–2 cm, puberulent with ca. 2 or 4 colleters at blade base; blades $4\text{--}5.5 \times 1.5\text{--}2.5$ cm, ovate-triangular, ovate, or cordiform, camptobrochidromous, apically acute or acuminate, basally cordate or auriculate, adaxially puberulent, abaxially pubescent or puberulent. Inflorescence 2- to 3-flowered, cymoid to corymbiform; peduncle 12–20 mm, puberulent; pedicels 14–17 mm, puberulent. Floral buds 0.8–1 cm, lanceolate or ovate-lanceolate; calyx lobes $3\text{--}4 \times 0.5\text{--}0.6$ mm, with 1 colleter below each sinus within, linear-lanceolate, abaxially puberulent, adaxially ± glabrous, verrucose trichomes 102–162 µm; corolla campanulate, tube 3–4 mm, puberulent outside, glabrous inside, lobes $10\text{--}12 \times 0.8\text{--}2$ mm, linear-lanceolate or ± filiform, spreading, twisted, abaxially pubescent or puberulent, adaxially ± glabrous to papillose, verrucose trichomes 59–105 µm; corona lobes $1.5\text{--}2 \times 0.4\text{--}0.5$ mm, flabeliform, apex dilated and slightly crenate, with 2 lateral fleshy appendages at base adaxially always lacking the tooth; gynostegium 1.8–2 mm high, ± sessile; anthers rectangular, with wings 1.4–1.5 mm, equal in size to the dorsum; connective appendage 0.5–1 mm, ovate to ± rotund; corpusculum $0.71\text{--}0.80 \times 0.12\text{--}0.15$ mm, ± linear in lateral view, longer than pollinia but not 2× longer, thin, laminar, planar; caudicles 0.25–0.30 mm, horizontal, fixed on base of corpusculum, broad, long-stipitate, teeth lateral, curved, free; pollinia $0.59\text{--}0.75 \times 0.10\text{--}0.15$ mm, cylindrical-oblong, clearly curved, equal in size; style-head 4–5 mm, elongate and exserted, ± thickened, bifid from the middle, with filiform branches. Follicle $13\text{--}14 \times 1.3\text{--}1.5$ cm, fusiform or oblong-ovate with elongate-acuminate tip, puberulent; seeds $8\text{--}10 \times 3\text{--}5$ mm, spathulate-curved.

Phenology. Collected in flower from February to June and October to November; in fruit from April to May, August, and December.

Distribution. Brazil: Minas Gerais and Rio de Janeiro.

Oxypetalum cordifolium occurs in southeastern Brazil in Rio de Janeiro and Minas Gerais, usually in low montane rainforest and disturbed forest, from 300–800 m. *Oxypetalum cordifolium* subsp. *brasiliense* is quite similar to *O. cordifolium* subsp. *pedicellatum* in lamina shape and overall appearance. The taxa are distinguished usually by the calyx lobe sinuses with no colleter or one colleter (vs. eight or nine colleters), corona adaxially without tooth (vs. adaxially with tooth), and pollinia long-stipitate and clearly curved in *O. cordifolium* subsp. *brasiliense* (vs.

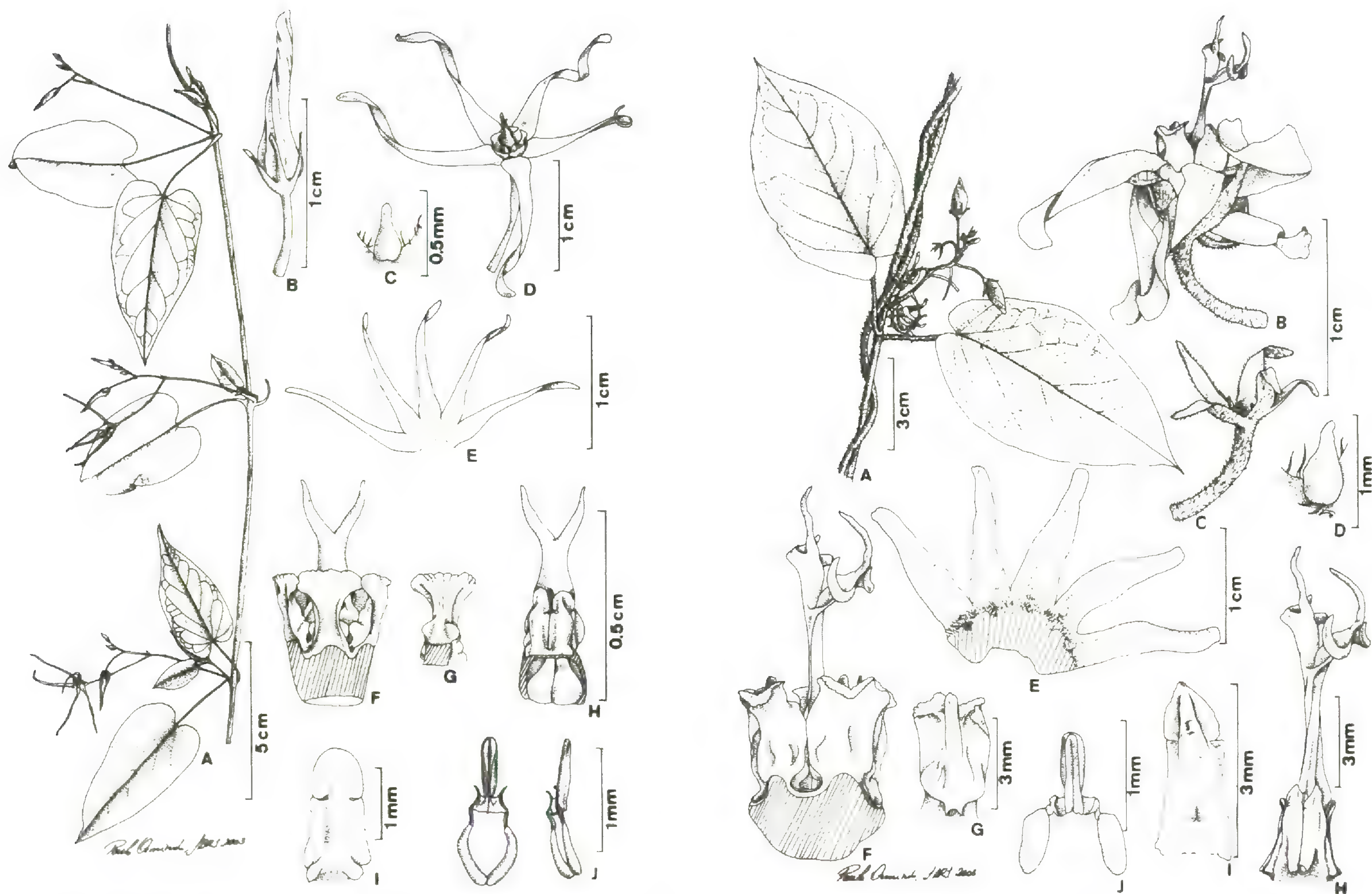


Figure 1 (left). *Oxypetalum cordifolium* subsp. *brasiliense*. —A. Flowering branch. —B. Floral bud. —C. Colleter in calyx lobe sinus. —D. Flower. —E. Corolla lobes, adaxial view. —F. Corona and stylar appendage with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Gynostegium. —I. Anther, abaxial view. —J. Pollinarium, frontal view and lateral view. Drawn from *N. Marquete et al. 447* by P. Ormindo.

Figure 2 (right). *Oxypetalum costae*. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Colleter in calyx lobe sinus. —E. Corolla lobes, adaxial view. —F. Corona and stylar appendage with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Gynostegium. —I. Anther, abaxial view. —J. Pollinarium. Drawn from *Braga et al. 1570* by P. Ormindo.

pollinia shortly stipitate and slightly curved in subsp. *pedicellatum*).

Specimens examined. BRAZIL. **Minas Gerais:** Marliéria, Parq. Est. Rio Doce, *Lombardi* 2866 (BHCB). **Rio de Janeiro:** Barra do Pirai, *Gehrt & Hoehne* 17324 (S, SP); Petrópolis, Caíparas, *Duarte* 1117 (RB); Resende, Serrinha, *Marquete et al.* 447 (R, RB); Rio de Janeiro, Camorim, *Occhioni & Pereira* 5712 (HB, RB).

5b. *Oxypetalum cordifolium* (Vent.) Schltr. subsp. ***pedicellatum*** (Decne.) Fontella & Goyder. Kew Bull. 60(1): 108. 2005. *Oxypetalum pedicellatum* Decne., Prodr. (DC.) 8: 582. 1844. *Gothofreda pedicellata* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. "in Brasilia," s.d., A. F. M. *Glaziou* 8795 (holotype G!, G photo at RB!; isotypes, BM!, R!, S!).

Oxypetalum pedicellatum Decne. var. *itaitaiense* Occhioni, Dusenía 3(3): 201. 1952. TYPE: Brazil. Rio de Janeiro: Itaitiaia, Km 4–5, 28 May 1949, *P. Occhioni* 1227 (holotype, RB 66461!).

Twining vine, branches glabrescent. Leaves with petiole 2–7.2 cm, puberulent, with 4 or 7 colleters at blade base; blades 6–9(12.5) × 3–5(8) cm, ovate to lanceolate, camptobrochidodromous, apically acuminate or elongate-acuminate, basally cordate to auriculate, usually with conspicuous reticulate nerving, puberulent adaxially and abaxially. Inflorescence 2- to 8-flowered, cymoid to corymbiform; peduncle 2–5(20) mm, puberulent; pedicels 17–23 mm, puberulent. Floral buds 0.6–1 cm, triangular or linear; calyx lobes 2–2.7 × 0.5–0.8 mm, with fascicle of 6 or 9 colleters below each sinus within, lanceolate, abaxially pubescent, adaxially puberulent, with verrucose trichomes 98–119 µm; corolla campanulate, tube 2–2.7 mm, puberulent to pubescent outside, glabrescent to puberulent inside, lobes 8–14 × 1.2–2 mm, ± linear, spreading, abaxially pubescent, adaxially puberulent, with verrucose trichomes 54–71 µm; corona lobes 1–2.5 × 0.7–1 mm, flabellate, apex truncate to retuse, thickened, verrucose, tooth adaxially present, shorter than corona lobe; gynostegium 1–2 mm high, sessile; anthers rectangular, with wings 0.7–1 mm, longer than dorsum; connective appendage 0.6–0.8 mm, oblong, ovate or elliptic; corpusculum 0.84–0.92 × 0.16–0.18 mm, linear-oblong, thin, laminar, planar, longer than pollinia but not 2× longer; caudicles 0.04–0.06 mm, fixed on base of corpusculum, horizontal, short-stipitate, teeth lateral, curved, free; pollinia 0.50–0.58 × 0.08–0.14 mm, cylindrical, slightly curved, sessile; style-head 2.6–4.5 mm, cylindrical, elongate and exserted, bifid from the middle, divergent. Follicle 6.5–13.8 × 0.9–1.2 cm, oblong-lanceolate, acuminate to apex, narrow and rounded at base, minutely pubescent; seeds 0.7–

1.2 × 0.3–0.4 mm, ovate-triangular, minutely verrucose, coma 1.5–2 cm.

Phenology. Collected in flower from January to December; in fruit from February to May.

Distribution. Brazil: Paraná, Rio de Janeiro, Santa Catarina, and São Paulo.

Oxypetalum cordifolium subsp. *pedicellatum* is found in low montane rainforest, montane rainforest, secondary rainforest, disturbed forest, grasslands, and along watercourses from 10 to 1050 m in Brazil. It is quite similar to *O. cordifolium* subsp. *brasiliense* in shape of the leaves, corona lobes, and pollinarium. It differs from the latter subspecies by its calyx lobe sinuses with a conspicuous fascicle of colleters (vs. no colleter or one colleter), caudicles shortly stipitate (vs. long-stipitate), and pollinia slightly curved (vs. pollinia clearly curved).

Specimens examined. BRAZIL. **Paraná:** Campina Grande do Sul, Rio Pardo, *Hatschbach* 7664 (MBM, RB). **Rio de Janeiro:** Parq. Nac. Itaitiaia, *Occhioni* 1211 (RB); Parati, Paraty à Cunha, *Nadruz et al.* 473 (RB, SP); Rio de Janeiro, Parq. Nac. Tijuca, Morro da Cocanha, *Braga et al.* 3926 (RUSU); Teresópolis, Parq. Nac. Serra dos Órgãos, *Occhioni* 1257 (RB). **Santa Catarina:** Ribeirão, Tapera, *Klein et al.* 7962 (HRB). **São Paulo:** Registro, *Fontella s.n.* (RB-145076).

6. *Oxypetalum costae* Occhioni, Dusenía 3(3): 200, tab. 11. 1952. TYPE: Brazil. Rio de Janeiro: "habitat Itaitiaia, planalto 2000 m," 22 Nov. 1938, *F. Markgraf* 3644 & *A. C. Brade* (holotype, RB!). Figure 2.

Twining shrub, branches tomentose. Leaves with petiole 2.5–6.5 cm, tomentose with 3 or 5 colleters at blade base; blades 6–11 × 3–6 cm, ovate, camptobrochidodromous, basally cordate, apically acuminate, adaxially pubescent to tomentose, abaxially tomentose. Inflorescence 4- to 8-flowered, cymoid to corymbiform; peduncle ca. 1.3 cm, tomentose; pedicels 7–15 mm, pubescent. Floral buds 1.2–1.4 mm, ovate-triangular; calyx lobes 6–8 × 1.5–2 mm, with 1 or 2 colleters below each sinus within, linear-triangular or triangular, pubescent to tomentose outside, glabrous inside; corolla tube 3–3.2 mm, ± campanulate, puberulent outside, glabrous inside; lobes 12–15 × 3–3.5 mm, spreading, twisted, abaxially pubescent, adaxially with sparse trichomes; corona lobes 3–4 × 2–2.5 mm, ± rectangular, emarginate at undulate apex, adaxially with tooth extending slightly beyond the corona apex; gynostegium 3–3.2 mm high, ± sessile; anthers rectangular, with wings 1.5–2 mm, longer than dorsum; connective appendage 1–1.5 mm, ovate; corpusculum 0.70–0.80 × 0.28–0.30 mm, obovate, slightly longer than pollinia, thick, not laminar, planar; caudicles

0.16–0.18 mm, horizontal, with teeth indistinct and included; pollinia $0.60\text{--}0.69 \times 0.20\text{--}0.27$ mm, $\pm$ ovate or $\pm$ elliptical, slightly shorter than corpusculum; style-head 7–10 mm, elongate and exserted, bifid at apex with laminar branchlets. Fruit not seen.

Phenology. Collected in flower in November.

Distribution. Brazil: Rio de Janeiro.

Oxypetalum costae is endemic to Rio de Janeiro, growing in high-altitude grasslands at the edge of cloud forest, from 1800 to 2000 m in Brazil. It is quite similar to *O. insigne* var. *burchellii* (E. Fourn.) Fontella in indument, shape of the leaves, corona lobes, and laminar style-head. However, it differs from the latter variety, principally in the thick corpusculum that is not laminar and is slightly longer than the pollinia (vs. not thickened laminar corpusculum that is shorter than pollinia) and the teeth of the caudicles included (vs. teeth of the caudicles exserted).

Specimens examined. BRAZIL. **Rio de Janeiro:** Itatiaia, Planalto, *Markgraf 3644 & Brade* (RB); Parq. Nac. Itatiaia, Pico das Agulhas Negras, *Braga et al. 1570* (RB).

7. *Oxypetalum glaziovianum* Loes., *Flora* 72: 78. 1889. TYPE: Brazil. Rio de Janeiro: Feb. [as II] 1888, *A. F. M. Glaziou 17143* (lectotype, designated here, P!; isotypes, C not seen, K!, K photo at RB!).

Oxypetalum mourai Hoehne, *Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas* 38(1): 77, n. 30, pl. 8, fig. 2 et pl. 42. 1916. Syn. nov. TYPE: Brazil. Rio de Janeiro: Serra das Araras-RJ, [from Herb.] *L. Damazio 6060* ex herb. Schwacke [Herb. J. T. Moura] (lectotype, designated here, pl. 8, fig. 2, in Hoehne, 1916).

Twining vine, branches puberulent or sparsely covered with white, adpressed trichomes. Leaves with petiole 0.7–1.4 cm, absent or with 2 colleters at blade base; blades $6.7\text{--}7.5 \times 1.2\text{--}1.4$ cm, oblong or $\pm$ oblong, brochidodromous, basally cordate, apically acute-mucronate, adaxially and abaxially glabrous, midvein puberulent, trichomes sparse and scattered at margins. Inflorescence 3-flowered, sciadioid; peduncle 1.6–2 cm, pubescent; pedicels 1–1.2 cm, pubescent. Floral buds ca. 6 mm, oblong; calyx lobes $1.8\text{--}2 \times 0.5\text{--}0.6$ mm, with 2 or 3 colleters below each sinus within, triangular, abaxially pubescent, adaxially glabrous; corolla shortly campanulate, tube 1.5–1.7 mm, outside and inside pubescent, at throat barbellate; lobes $8.5\text{--}8.8 \times 1.2\text{--}1.5$ mm, linear-oblong, spreading and slightly twisted, adaxially glabrous, abaxially pubescent; corona with lobes $1\text{--}1.3 \times 0.8\text{--}1.2$ mm, $\pm$ rotund or $\pm$ rhomboid, apex rounded, slightly undulate, inside with 2 lateral expansions; gynostegium ca. 4 mm high, $\pm$ sessile; anthers rectangular, with wings 0.5–0.6 mm, longer

than the dorsum; connective appendage 0.6–0.7 mm, elliptical; corpusculum $2.44\text{--}3.11 \times 0.29\text{--}0.52$ mm, linear-oblong, thin, laminar, planar, $3\times$ longer than pollinia; caudicles 0.26–0.35 mm, horizontal, with lateral teeth divergent, free, briefly or shortly stipitate; pollinia $0.66\text{--}0.82 \times 0.29\text{--}0.35$ mm, oblong or $\pm$ elliptical, shorter than corpusculum; style-head 2.8–3 mm, cylindrical, exserted, bifid from the middle or above, with lanceolate or linear branches. Follicle not seen.

Phenology. Collected in flower in January, February, and October.

Distribution. Brazil: Rio de Janeiro.

Oxypetalum glaziovianum is endemic to Rio de Janeiro, growing in Atlantic rainforest. According to Glaziou (1910: 461) this species also occurs at the crest of the Serra dos Órgãos, Teresópolis. *Oxypetalum glaziovianum* is quite similar to species in the *O. cordifolium* group in its flattened style-head and its laminar corpusculum; it is also quite similar to the *O. insigne* group in its flattened, laminar corpusculum. However, *O. glaziovianum* differs from these taxa principally in its spathulate or $\pm$ spathulate corolla lobes, the form of the corona $\pm$ rotund to $\pm$ rhomboid, and the divaricate branches of the style-head.

Lectotypification of *Oxypetalum glaziovianum* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of three isotype specimens distributed, *Glaziou 17143* (P) is selected.

The type of *Oxypetalum mourai* was not found in herbaria in Rio de Janeiro (R, RB), São Paulo (SP), or in various European herbaria (B, BM, K, M, P, W, WU). Plate 8, figure 2, in Hoehne (1916), based on *Damazio 6060*, ex herb. Schwacke (Herb. J. T. Moura), is selected as lectotype.

Specimens examined. BRAZIL. **Rio de Janeiro:** Teresópolis, Montanha do Louzada, *Saldanha 6894* (R); Serra Cavallo, *A. C. Brade 9839* (R).

8. *Oxypetalum glaziovii* (E. Fourn.) Fontella & Marquete, *Bradea* 9(5): 24. 2003. *Melinia glaziovii* E. Fourn. [as “glaziovi”], *Fl. Bras.* 6(4): 289. 1885. TYPE: Brazil. Rio de Janeiro: “in montibus Agulhas Negras,” *A. F. M. Glaziou 8802* (lectotype, designated by Fontella-Pereira & Marquete, 2003: 24, P!; isotype, R!).

Melinia hilariana E. Fourn., *Fl. Bras.* 6(4): 290. 1885. TYPE: Brazil. Minas Gerais: *A. F. C. P. St.-Hilaire s.n.* (holotype, P!).

Oxypetalum urbanianum Silveira, *Fl. Ser. Min.*: 25. 1908. TYPE: Brazil. Minas Gerais: “in campis siccis in Serra do Papagaio, Apr. 1897,” *A. Silveira 322* (holotype, R!, R photo at RB!).

Twining vine, branches puberulent. Leaves with petiole 5–13 mm, puberulent, with 2 colleters at blade base; blades 17–30 × 12–16 mm, ovate, brochidodromous, basally cordate, apically acuminate, adaxially and abaxially glabrous, puberulent only at margins and midnerve. Inflorescence 2- to 4-flowered, sciadioid; peduncle 7–13 mm, puberulent; pedicels 3–5 mm, puberulent. Floral buds 4–5 mm, triangular or ovate-triangular; calyx lobes 2.2–3 × 0.4–0.5 mm, with 1 or 3 colleters below each sinus within, lanceolate, abaxially pubescent, adaxially glabrous, with verrucose trichomes 119–301 µm; corolla campanulate, tube 1–2 mm, glabrous outside, barbate inside, lobes 4–4.5 × 1.5–2 mm, ovate, reflexed, abaxially pubescent at middle, adaxially puberulent, with trichomes barbate at base with verrucose trichomes (68)116–179 µm; corona lobes 0.9–1 × 0.4–0.8 mm, oblong, adaxially with a conspicuous tooth oblong and fleshy; gynostegium 1–1.2 mm high, ± sessile; anthers quadrate, with wings 0.3–0.4 mm, longer than dorsum; connective appendage 0.3–0.5 mm, transverse-rectangular; corpusculum 0.26–0.29 × 0.07–0.08 mm, linear-oblong, thin, laminar, planar; caudicles 0.12–0.14 mm, horizontal, fili-form, teeth included, shortly stipitate; pollinia 0.26–0.30 × 0.08–0.09 mm, linear-oblong, almost equal to corpusculum; style-head 2–2.2 mm, cylindrical, elongate and exserted, bifid or bilobate at apex. Follicle 2.8–3.5 × 4–7 cm, fusiform, with elongate-acuminate tip, puberulent; seeds not seen.

Phenology. Collected in flower from January to June and from September to December; in fruit from January to March and in December.

Distribution. Brazil: Minas Gerais (Fontella-Pereira & Marquete, 2003), Rio de Janeiro, and São Paulo.

Oxypetalum glaziovii is found in rocky thickets in high-altitude grasslands and campos rupestres, from 1800 to 2600 m in Brazil. This species is readily recognized by its small leaves, horizontal caudicles with included teeth, and a style-head that is elongated, exserted, and bifid at apex. It is morphologically similar to *O. pachyglossum* and *O. alpinum* var. *alpinum* in the caudicle with teeth included. It differs in its small ovate leaves (vs. long and narrowly oblong to lanceolate leaves in *O. pachyglossum* and *O. alpinum* var. *alpinum*). It is represented in Minas Gerais only by the type specimen for *Melinia hilariana*.

Specimens examined. BRAZIL. **Rio de Janeiro:** Prateleiras, Registro and Itamonte, Parq. Nac. Itatiaia, Marquete et al. 451 (R, RB); Parq. Nac. Itatiaia, Abrigo Rebouças, Castellanos 25670 (F, GUA, RB, SP); Resende, Serra da Mantiqueira, Mauá, Rancho, Kaempfe 409 (RB). **São Paulo:** Queluz, Pedra da Mina, Shepherd et al. 97-30 (HB, HRCB).

9. *Oxypetalum insigne* (Decne.) Malme, Ark. Bot. 21A(3): 31. 1927. *Calostigma insigne* Decne., Ann. Sci. Nat., Bot., ser. 2, 9: 344. 1838. TYPE: Brazil. São Paulo: “hab. in Brasilia prov. San-Paolo,” C. B. Gaudichaud 375 (holotype, P!; isotype, F!).

9a. *Oxypetalum insigne* (Decne.) Malme var. *insigne*

Calostigma guilleminianum Decne., Prodr. (DC.) 8: 581. 1844. TYPE: Brazil. Minas Gerais: 1834, P. Claussen 354 (lectotype, designated here, P!; isotype, P fragment at F!). Figure 3.

Twining vine, branches tomentose. Leaves with petiole (3)9–15(31) mm, villous, with 2 or 3 colleters at blade base; blades (4)6–8(9.5) × (1.7)2.3–4(6) cm, ovate to obovate or elliptic to narrowly elliptic, brochidodromous, basally cordate, apically acuminate to mucronate, adaxially and abaxially densely pubescent to hirsute-tomentose. Inflorescence 3- to 10-flowered, cymoid to corymbiform; peduncle (0.3)0.5–1 cm, villous or woolly; pedicels 12–19(35) mm, tomentose to villous. Floral buds 1.5–2 cm, lanceolate to ovate; calyx lobes 4–6 × 0.4–0.5 mm, with 3 or 6 colleters below each sinus within, triangular-lanceolate, abaxially tomentose, adaxially glabrous, tomentose or puberulent, with verrucose trichomes 153–251 µm; corolla campanulate, tube 2.7–4.3 mm, pubescent outside, puberulent inside, lobes 14.5–40 × 1–4.2 mm, linear-lanceolate to linear-elongate, spiralled, reflexed, abaxially pubescent, adaxially puberulent, glabrous or glabrate, with verrucose trichomes 154–199 µm; corona lobes 3.5–4.5 × 1.2–1.5 mm, rectangular or oblong, emarginate or truncate, apex verrucose, tooth adaxially present, sometimes higher than corona lobe; gynostegium 1.7–3.5 mm high, sessile; anthers ± rectangular, with wings 0.7–1.3 mm, longer than dorsum; connective appendage 0.7–2.5 mm, ovate; corpusculum 1.6–2.0 × 0.2–0.5 mm, thin, laminar, planar, oblong, conspicuously longer than pollinia; caudicles 0.06–0.16 mm, horizontal, fixed at base of corpusculum, shortly pedicellate, teeth lateral, curved and free; pollinia 0.36–0.66 × 0.12–0.22 mm, oblong; style-head 3.8–8 mm, cylindrical, elongate and exserted, crateriform or coroniform, irregularly laciniate or bifid with trilobate apex. Fruit not seen.

Phenology. Collected in flower in February, from April to August, October, and December.

Distribution. Brazil: Minas Gerais, Rio de Janeiro, Santa Catarina, and São Paulo.

Oxypetalum insigne var. *insigne* is found in Rio de Janeiro in low montane and montane rainforest, secondary rainforest, thickets, gallery forest, and

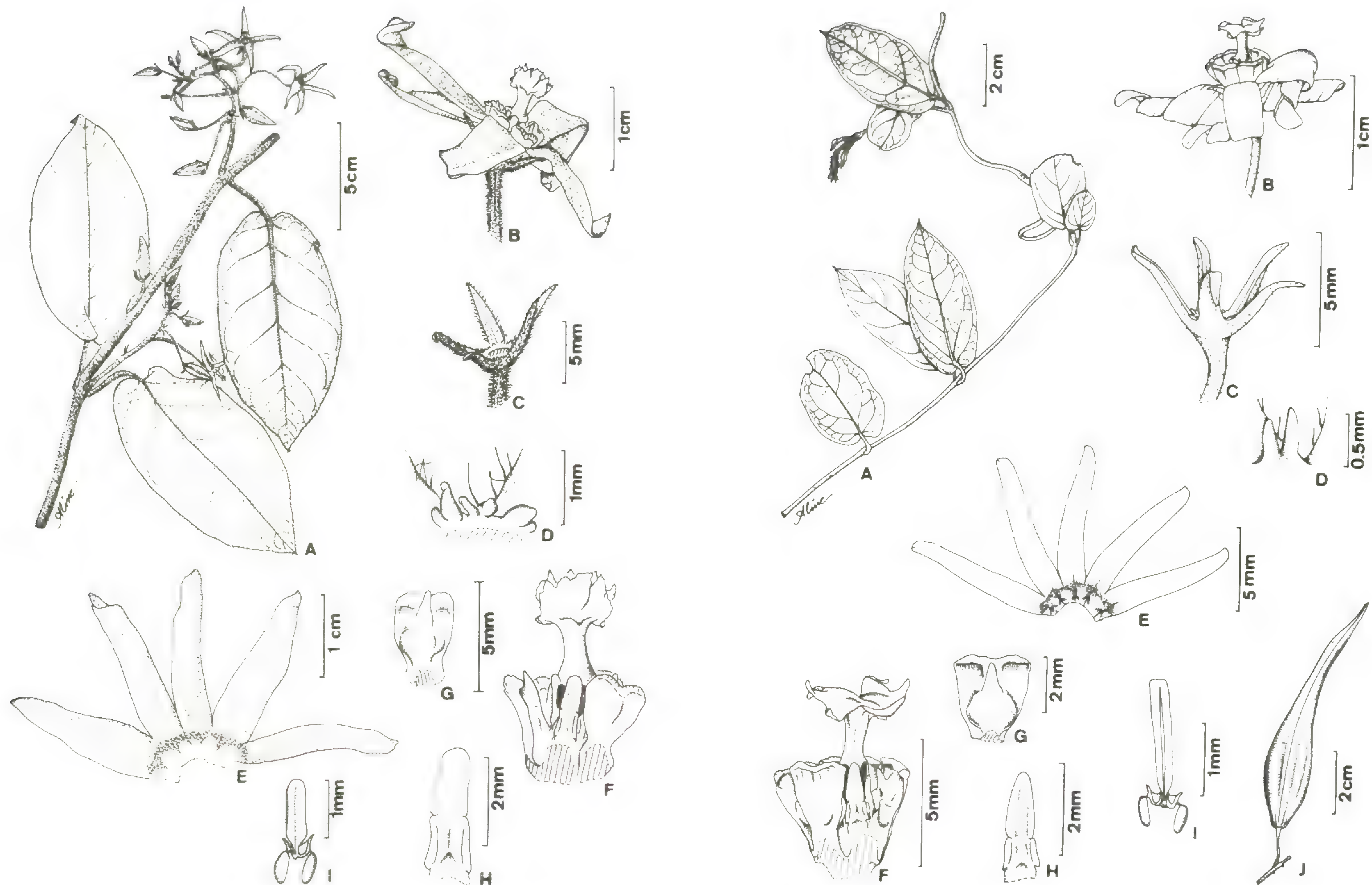


Figure 3 (left). *Oxypetalum insigne* var. *insigne*. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Colleters in calyx lobe sinus. —E. Corolla lobes, adaxial view. —F. Corona and gynostegium with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Anther, abaxial view. —I. Pollinarium. Drawn from *Brade 17472* by A. S. Lima.

Figure 4 (right). *Oxypetalum insigne* var. *glabrum*. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Colleters in calyx lobe sinus. —E. Corolla lobes, adaxial view. —F. Corona and gynostegium with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Anther, abaxial view. —I. Pollinarium. —J. Fruit. Drawn from *Rapini et al. 317* by A. S. Lima.

high-altitude grasslands. In other Brazilian states, *O. insigne* var. *insigne* occurs in campos rupestres, on marsh edges, and along watercourses and roadsides, from 50 to ca. 1800 m. It is quite similar to *O. rusticum* Rapini in the shape of the corolla and corona lobes, the laminar corpusculum, and a coroniform or crateriform style-head. However, it differs from this species principally in its densely pubescent to tomentose leaves (vs. pilose to villous leaves) and a shorter corpusculum (1.6–2 mm vs. 2.5–2.6 mm).

Lectotypification of *Calostigma guilleminianum* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of the two syntype specimens distributed, the specimen *Claussen* 354 (P) is selected.

In addition to the taxa mentioned here, the following infraspecific taxa belonging to this group were also established: *O. insigne* var. *glaziovii* (E. Fourn.) Fontella & E. A. Schwarz (Fontella-Pereira & Schwarz, 1983), *O. insigne* var. *glabrum* (Decne.) Fontella & E. A. Schwarz (Fontella-Pereira & Schwarz, 1983), *O. insigne* f. *baetaeanum* (Silveira) Fontella & E. A. Schwarz (Fontella-Pereira & Schwarz, 1983), *O. insigne* var. *boraceiense* Fontella-Pereira & E. A. Schwarz (Fontella-Pereira & Schwarz, 1984b), *O. insigne* var. *burchellii* (E. Fourn.) Fontella (Fontella-Pereira, 1990), *O. insigne* var. *bresolinii* Fontella (Fontella-Pereira, 1990), and *O. insigne* var. *nitidum* (Malme) Fontella & E. A. Schwarz (Fontella-Pereira et al., 1997). *Oxypetalum insigne* var. *glabrum*, *O. insigne* f. *baetaeanum*, and *O. insigne* var. *insigne* are clearly delimited in the identification key by Fontella-Pereira et al. (1984). *Oxypetalum insigne* var. *insigne*, *O. insigne* var. *burchellii*, and *O. insigne* var. *bresolinii* were illustrated and clearly separated by Fontella-Pereira et al. (2004). *Oxypetalum insigne* var. *insigne*, *O. insigne* var. *glaziovii*, *O. insigne* var. *boraceiense*, *O. insigne* var. *burchellii*, and *O. insigne* var. *nitidum* were also clearly delimited by Farinaccio (2005).

Specimens examined. BRAZIL. **Minas Gerais:** *Guillemin s.n.* (P); Ouro Preto, Andorinhas Mariana–Belo Horizonte, Andorinhas, Belo Horizonte, *Fontella* 1091 (RB); Camarinhas, *Marquete et al.* 295 (RB); Lima Duarte, Dist. Conceição Ibitipoca, Ibitipoca to Santana de Garambel, *Marquete et al.* 381 (R, RB); Dist. Conceição Ibitipoca, Parq. Est. Ibitipoca, Barro Preto Lagoa Seca, *Marquete et al.* 342 (RB); Dist. Conceição Ibitipoca, Parq. Est. Ibitipoca, Monjolinho, *Marquete et al.* 366 (RB); Dist. Conceição Ibitipoca, Parq. Est. Ibitipoca, Janela do Céu, *Marquete et al.* 369 (RB). **Rio de Janeiro:** Itatiaia, Parq. Nac. Itatiaia, *Oechioni* 1219 (RB); Maromba, *Brade* 17472 (RB); Macieiras, V. L. G. *Klein et al.* 666 (RB). **Santa Catarina:** Governador Celso Ramos, Jordão, *Klein* 9581 (HBR). **São Paulo:** Cunha, Res. Flor., *Filho et al.* 281 (HCRB, SP).

9b. *Oxypetalum insigne* var. *glabrum* (Decne.)
Fontella & E. A. Schwarz, *Bradea* 4(3): 17. 1983.

Calostigma glabrum Decne., Prodr. (DC.) 8: 581. 1844. *Oxypetalum glabrum* (Decne.) Malme, Ark. Bot. 21A(3): 29. 1927. *Oxypetalum glabrum* (Decne.) T. Mey., *Dusenian* 2(6): 366. 1951. TYPE: Brazil. Minas Gerais: “Sierra da Piedade,” *P. Claussen* 329 (holotype, P!, P photo at RB!). Figure 4.

Twining vine, branches glabrous or slightly pubescent. Leaves with petiole 6–7 mm, pubescent, with 2 colleters at blade base; blades 3.5–4.6 × 1.3–1.5 cm, elliptic, lanceolate, or ovate-lanceolate, brochidodromous, basally slightly cordate or rotundate, apically slightly acuminate, adaxially and abaxially glabrous or glabrescent, puberulent at nerves. Inflorescence 2- to 3-flowered, cymoid to corymbiform; peduncle 0.6–1.3 cm, puberulent; pedicels 11–14 mm, puberulent. Floral buds ca. 0.9 cm, ovate-lanceolate; calyx lobes 2.5–3.5 × 0.2–0.3 mm, with 1 or 2 colleters below each sinus within, triangular-linear, abaxially puberulent and adaxially glabrous, with smooth trichomes 61–99 µm; corolla campanulate, tube 1.8–2 mm, glabrous or glabrate outside and inside, lobes 8–13 × 1.8–2 mm, linear-lanceolate, spiralled, reflexed, abaxially glabrous or glabrate, adaxially glabrous; corona with lobes ± rectangular, emarginate or truncate, verrucose at apex, tooth adaxially present, usually equal or slightly shorter than corona lobe and with 2 fleshy processes; gynostegium ca. 2 mm high, sessile; anthers ± quadrate, with wings 1.8–2 mm, longer than dorsum; connective appendage 0.6–2.3 mm, ovate; corpusculum 1.53–1.83 × 0.19–0.22 mm, oblong, thin, laminar, planar, conspicuously longer than pollinia; caudicles 0.21–0.22 mm, horizontal, fixed at base of corpusculum, shortly pedicellate; teeth lateral, curved and free; pollinia 0.36–0.43 × 0.11–0.12 mm, oblong; style-head 2.8–4 mm, cylindrical, elongate and exerted, apex planar, shell-shaped or bifid, with divaricate or erect branches; 1 vascular bundle. Follicles 7 × 1.5 cm, lanceolate, with long-acuminate tip, glabrous; seed not seen.

Phenology. Collected in flower in January, April, May, November, and December; in fruit in May.

Distribution. Brazil: Minas Gerais, Rio de Janeiro, and São Paulo.

Oxypetalum insigne var. *glabrum* is found in Rio de Janeiro in montane rainforest; in other Brazilian states, it also occurs in grasslands and campos rupestres from 1250 to 1752 m. It is morphologically similar to *O. insigne* var. *insigne* or *O. insigne* var. *glaziovii* in the shape of the corolla and corona lobes, the laminar corpusculum, and the style-head. However, it differs from *O. insigne* var. *insigne* principally

in its corolla lobes adaxially glabrous or glabrate (vs. sparsely pubescent), the narrower corpusculum (0.19–0.22 mm vs. to 0.2–0.5 mm), and the shorter style-head (2.8–4 mm vs. 3.8–8 mm) that is bifid and shell-shaped at the apex (vs. trilobate at apex).

Specimens examined. BRAZIL. **Minas Gerais:** Santa Barbara, Serra do Caraça, Pico do Inficionado, *Rapini et al.* 317 (SP, SPF). **Rio de Janeiro:** Teresópolis, *Glaziovii* 1770 (R).

9c. *Oxypetalum insigne* var. *glaziovii* (E. Fourn.) Fontella & E. A. Schwarz, *Bradea* 4(3): 17. 1983. *Calostigma glaziovii* E. Fourn., *Fl. Bras.* 6(4): 286, pl. 81. 1885. *Calostigma glabrum* var. *glaziovii* (E. Fourn.) Hoehne, *Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas*, 38(2): 16, tab. 6, fig. 1, et pl. 7. 1916. *Oxypetalum glabrum* var. *glaziovii* (E. Fourn.) T. Mey., *Dusenian* 2(6): 368. 1951. TYPE: Brazil. Rio de Janeiro: Friburgo, A. F. M. *Glaziovii* 14087 (holotype, P!, P photo at HB!; isotype, R!).

Oxypetalum kalanthum Silveira, *Fl. Serr. Min.*: 25. 1908. TYPE: Brazil. Minas Gerais: "in campis ad Morro do Bispo, prope urbem Ayuruoca," Nov. 1897, A. Silveira 318 (holotype, R!; isotypes, B, B photo at F, RB!, NY!).

Calostigma glabrum var. *macranthum* Hoehne, *Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas* 38(2): 17. 1916. *Oxypetalum glabrum* var. *macranthum* (Hoehne) T. Mey., *Dusenian* 2(6): 366. 1951. TYPE: Brazil. Rio de Janeiro: Alto da Serra do Itatiaia, Oct. 1903, P. Dusén 2002 (holotype, R!).

Twining vine, branches pubescent or glabrescent. Leaves with petiole 0.5–1 cm, tomentose or pubescent, with 1 or 2 colleters at blade base; blades 4–6.5 × 1.7–2.2 cm, ovate or ovate-lanceolate, brochidodromous, basally cordate or rotundate, apically acuminate, adaxially and abaxially glabrous or puberulent at midnerve and at margin. Inflorescence 2- to 4-flowered, cymoid to corymbiform; peduncle 0.4–1 cm, pubescent or slightly pubescent; pedicels 8–10 mm, pubescent. Floral buds 0.8–0.9 cm, triangular; calyx lobes 3.8–5.2 mm, with 3 or 4 colleters below each sinus within, triangular-lanceolate, abaxially slightly pubescent, adaxially glabrous, with verrucose trichomes 92–140 µm; corolla campanulate, tube 1.8–2 mm, glabrous outside, pubescent inside, lobes 11–16 × 2–2.5 mm, lanceolate to elongate, twisted, reflexed or spreading, abaxially puberulent, adaxially sparsely pubescent, with verrucose trichomes 75–117 µm; corona lobes 1–1.5 × 1.2–1.8 mm, rectangular, with emarginate or truncate, verrucose apex, tooth adaxially present, equal or slightly shorter than corona lobe with 2 fleshy processes; gynostegium 1.8–2 mm high, sessile; anthers ± rhombic, with wings 1.8–1.9 mm, longer than dorsum; connective appendage 0.7–2.4 mm,

ovate; corpusculum 1.23–1.35 × 0.15–0.21 mm, oblong, thin, laminar, planar, conspicuously longer than pollinia; caudicles 0.21–0.23 mm, horizontal, fixed on base of corpusculum, shortly stipitate, teeth lateral, curved and free; pollinia 0.36–0.39 × 0.13–0.16 mm, oblong; style-head 2.7–3.8 mm, cylindrical, elongate and exerted, usually planar with 2 trilobate branches at apex. Fruit not seen.

Phenology. Collected in flower in January, February, June, August, and September to December.

Distribution. Brazil: Minas Gerais, Rio de Janeiro, and São Paulo.

Oxypetalum insigne var. *glaziovii* is found in montane rainforest and high-altitude grasslands from 1700 to 2550 m in Brazil. It is quite similar to *O. insigne* var. *glabrum* in the shape of the leaves, corolla and corona lobes, and pollinarium. It differs from *O. insigne* var. *glabrum* principally in its corolla lobes adaxially sparsely pubescent (vs. glabrous or glabrate), corpusculum truncate at apex and shorter (1.23–1.35 mm vs. not truncate, 1.53–1.83 mm), and style-head cylindrical, usually with trilobate branches at apex (vs. shell-shaped or bifid at apex).

Specimens examined. BRAZIL. **Minas Gerais:** Caparaó, Parq. Nac. Caparaó, *Hatschbach* 31432 & *Ahumada* (S). **Rio de Janeiro:** Itatiaia, Prateleiras, Registro and Itamonte, Hotel Alsene, *Marquete et al.* 450 (R, RB); Macaé, Dist. Glicério, Pico do Frade, *Ribeiro et al.* 914 (RB); Petrópolis, Caxambú, Morro do Inferno, *Fernandes* 469 (GUA); Teresópolis, Pedra Chapadão, *Brade* 9960 (R). **São Paulo:** Boracéia, Salesópolis, *Kuhlmann* 1694 (SP).

10. *Oxypetalum jacobinae* Decne., *Prodr.* (DC.) 8: 584. 1844. *Gothofreda jacobinae* (Decne.) Kuntze, *Revis. Gen. Pl.* 2: 420. 1891. TYPE: Brazil. Bahia: "ad Jacobina," J. S. Blanchet 3646 (holotype, G!, G photo at NY!, P!, RB!). Figure 5.

Oxypetalum dentatum E. Fourn., *Fl. Bras.* 6(4): 263. 1885. *Gothofreda dentata* (E. Fourn.) Kuntze, *Revis. Gen. Pl.* 2: 420. 1891. TYPE: Brazil. Minas Gerais: "ad Capoeiras pr. Fazenda de Monte Novo," A. F. C. P. *St.-Hilaire* 1077 (holotype, P!; isotype, P fragment at F!, P photo at F!).

Oxypetalum lagoense E. Fourn., *Fl. Bras.* 6(4): 264. 1885. *Gothofreda lagoensis* (E. Fourn.) Kuntze, *Revis. Gen. Pl.* 2: 420. 1891. TYPE: Brazil. Minas Gerais: Lagoa Santa, "in marginibus silvarum," *Hb. Eug. Warming* 1864/2 (holotype, C!).

Twining vine, branches tomentose. Leaves with petiole 0.5–1.5 cm, pubescent or tomentose; blades 5–10 × 1.5–4 cm, moss green adaxially, greenish abaxially, ovate-oblong, camptobrochidodromous, apically acuminate, base cordate or auriculate, adaxially pubescent or tomentose, abaxially densely pubescent

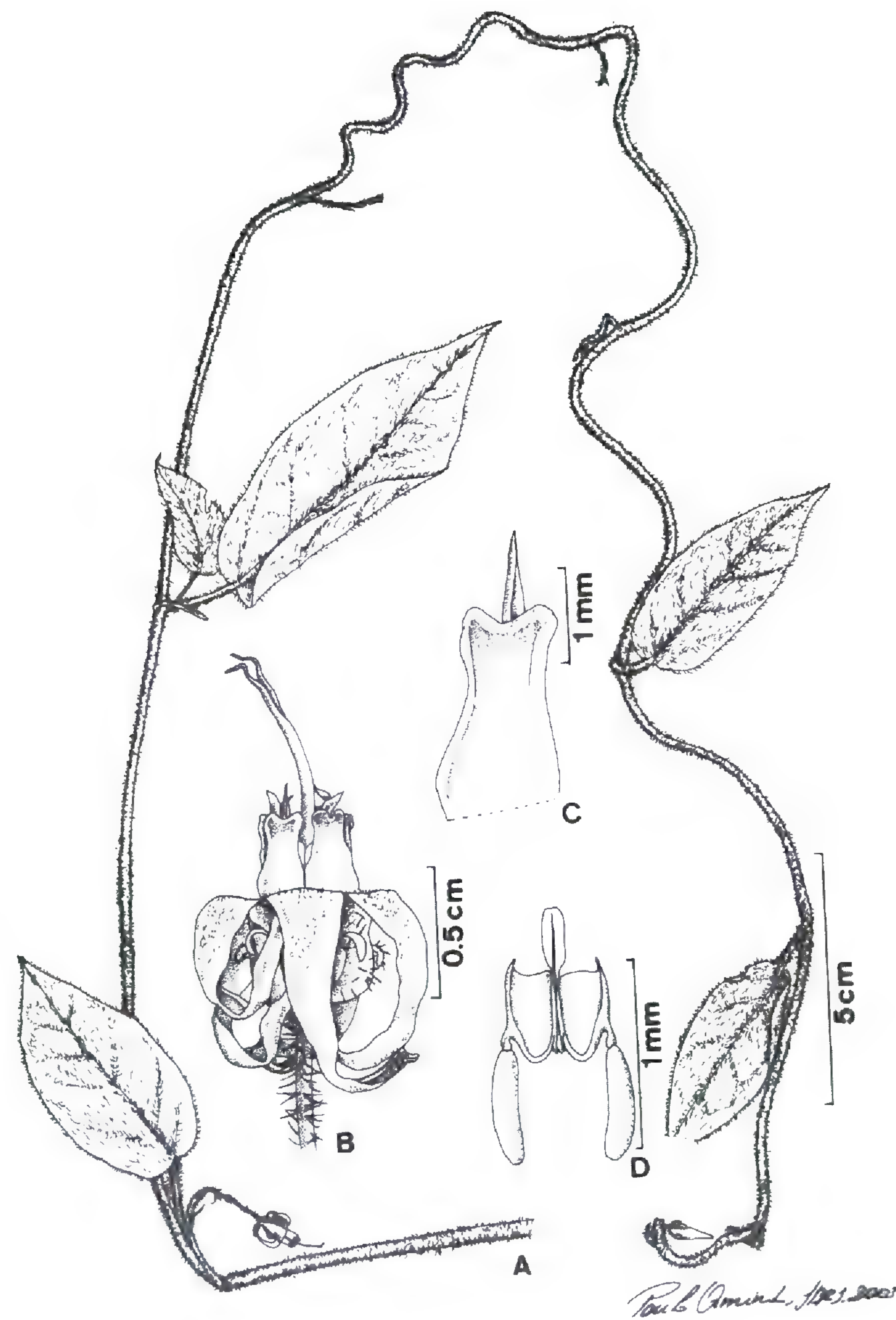
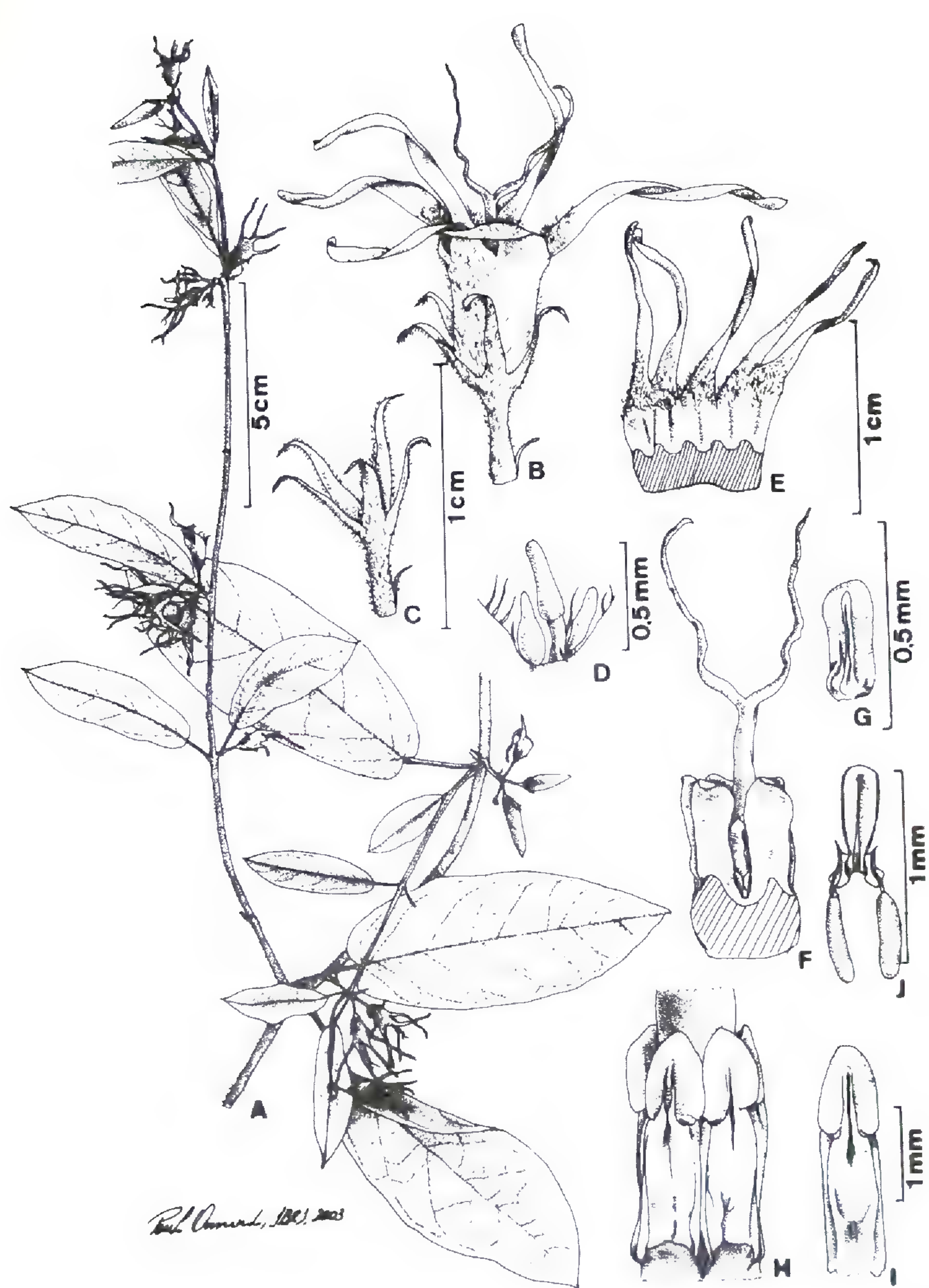


Figure 5 (left). *Oxypetalum jacobinae*. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Colleters in calyx lobe sinus. —E. Corolla lobes, adaxial view. —F. Corona and gynostegium with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Gynostegium part. —I. Anther, abaxial view. —J. Pollinarium. Drawn from *Fontella 1023, W. Vidal 362 e M. Vidal et al. 392*. Drawings by P. Ormino.

Figure 6 (right). *Oxypetalum lutescens*. —A. Flowering branch. —B. Flower. —C. Corona lobe, abaxial view. —D. Pollinarium. A–C drawn from *Glaziou 6903*, D drawn from *Hoehne 1916*, pl. 9, fig. 1. Drawings by P. Ormino.

or tomentose. Inflorescence 5- to 8-flowered, sciadoid, $\pm$ sessile, flowers 1–1.5 cm; pedicels 2–3.5 mm, tomentose. Floral buds 1.4–1.5 cm, triangular; calyx lobes $5\text{--}5.5 \times 0.5\text{--}1$ mm, with 1 or 3 colleters below each sinus within, linear, abaxially hirsute, adaxially pubescent, verrucose trichomes $260\text{--}447\text{ }\mu\text{m}$; corolla tube 4–6 mm, $\pm$ campanulate, pubescent outside, pubescent or tomentose inside, barbellate at throat, lobes $7\text{--}12 \times 1.5\text{--}2$ mm, linear, $\pm$ erect, twisted, abaxially and adaxially pubescent or glabrescent, verrucose trichomes $165\text{--}280\text{ }\mu\text{m}$; corona lobes $3\text{--}3.5 \times 1\text{--}1.5$ mm, $\pm$ rectangular or $\pm$ oblong, apex obtuse or rounded, adaxially with linear tooth usually reaching to tip of corona lobe; gynostegium 2–3 mm high, $\pm$ sessile; anthers rectangular, with wings 2.5–3 mm, longer than dorsum; connective appendage 0.5–0.6 mm, ovate-acuminate; corpusculum $0.60\text{--}0.65 \times 0.25\text{--}0.27$ mm, $\pm$ oblong, thin, not laminar, planar, longer than pollinia; caudicles 0.26–0.28 mm, fixed at base of corpusculum, $\pm$ horizontal, shortly stipitate, teeth lateral, curved and free; pollinia $0.45\text{--}0.53 \times 0.13\text{--}0.15$ mm, apex oblong or obtuse, base rounded, slightly shorter than corpusculum; style-head 9–11 mm, $\pm$ cylindrical, elongate and exserted, bifid to middle, branches linear. Fruit not seen.

Phenology. Collected in flower in April, May, and October.

Distribution. Brazil: Bahia, Minas Gerais, and Rio de Janeiro.

Oxypetalum jacobinae is found in Brazil in low montane or montane rainforest, semi-deciduous seasonal forest, secondary rainforest, thickets, grasslands, and along roadsides, from 200 to 1250 m. It is quite similar to *O. erianthum* Decne. in habit and pubescence, the $\pm$ campanulate corolla, and the rectangular anthers. It differs from *O. erianthum* principally in its oblong to $\pm$ rectangular corona lobes with apex obtuse or rounded (vs. oval corona lobes with apex rounded or truncate), $\pm$ horizontal caudicles with free teeth (vs. descending caudicles with included teeth), and $\pm$ oblong and broader corpusculum (vs. linear-oblong and narrowed corpusculum).

Specimens examined. BRAZIL. **Bahia:** Jacobina, Blanchet 3646 (P). **Minas Gerais:** Viçosa, Prefeitura, Inst. de Ciências Biol. Univ. de Viçosa, Fontella 1058 & Vidal (RB). **Rio de Janeiro:** Teresópolis, Serra de Teresópolis, Neves Armond s.n. (R-5146).

11. *Oxypetalum lanatum* Decne. ex E. Fourn., Fl. Bras. 6(4): 266, pl. 76, 1885. TYPE: Brazil. Rio de Janeiro: “in summo jugo Serra dos Órgãos, aprili,” A. F. M. Glaziov 4093 (lectotype, designated here, P!, P photo at HB!, isotypes, K!, NY!, R!).

Twining vine, branches lanose. Leaves with petiole 5–10 mm, fulvous-tomentose, with 2 colleters at blade base; blades $4\text{--}5 \times 1.5\text{--}2$ cm, ovate or oblong-ovate, apically acute or mucronate, basally slightly cordate, campitobrochidromous, adaxially tomentose, abaxially fulvous-woolly. Inflorescence (2)4- to 5-flowered, cymoid to corymbiform; peduncle 6–10 mm, fulvous-tomentose; pedicels 10–20 mm, tomentose. Floral buds 0.8–1.2 cm, elliptical; calyx lobes $5\text{--}6 \times 1.5\text{--}1.8$ mm, with 1 or 2 colleters below each sinus within, linear-lanceolate, abaxially tomentose, adaxially pubescent, with verrucose trichomes $236\text{--}472\text{ }\mu\text{m}$; corolla tube 3–4.5 mm, campanulate, pubescent outside, glabrous inside, lobes $10\text{--}12 \times 5\text{--}6$ mm, base vinaceous, lanceolate or $\pm$ elliptical, spreading, twisted, abaxially pubescent, adaxially glabrous, with verrucose trichomes; corona $3\text{--}4.5 \times 1.5\text{--}2$ mm, rectangular, apex truncate, tooth adaxially present, longer than corona lobe; gynostegium 3–3.2 mm high, $\pm$ sessile; anthers $\pm$ rectangular, with wings 1.5–1.7 mm, slightly longer than dorsum; connective appendage 1–1.5 mm, ovate; corpusculum $1.10\text{--}1.20 \times 0.30\text{--}0.35$ mm, linear or oblong, thin, laminar, planar, conspicuously longer than pollinia; caudicles 0.36–0.38 mm, not fixed on base of corpusculum, horizontal, teeth lateral, curved and free, shortly pedicellate; pollinia $0.50\text{--}0.54 \times 0.15\text{--}0.17$ mm, oblong, slightly curvate, $2\times$ shorter than corpusculum; style-head 6–7 mm, cylindrical, exserted, bifid to middle, with divaricate branchlets. Follicle $6.2\text{--}8.7 \times 1.2\text{--}1.7$ cm, lanceolate or fusiform with acuminate tip, base obtuse, densely tomentose; seed not seen.

Phenology. Collected in flower from January to June, September, and November; in fruit April, May, August, September, and November.

Distribution. Brazil: Minas Gerais and Rio de Janeiro.

Oxypetalum lanatum is found in montane rainforest, gallery forest, cloud forest, high-altitude grasslands, and campos rupestres on rocky outcrops from 1000 to 2400 m in Brazil. It is quite similar to *O. sublanatum* in habit, shape, and indumentum of the leaf blade, flowers, corona lobes, and laminar corpusculum. It differs from this taxon principally in its widely spreading corolla lobes (vs. reflexed corolla lobes), corona lobes adaxially with a conspicuous tooth surpassing its apex (vs. tooth absent), and the elongate, bifid, and exserted style-head (vs. style-head shorter and $\pm$ entire, enclosed by corona at apex).

Lectotypification of *Oxypetalum lanatum* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of the four syntype specimens distributed, Gardner 5811 (CAMB, K, P, R), Glaziov 7759 (P), Tweedie s.n. (K),

and *Glaziou* 4093 (P), the *Glaziou* 4093 specimen is selected as lectotype.

Specimens examined. BRAZIL. **Minas Gerais:** Lima Duarte, Conceição de Ibitipoca, Parq. Est. Ibitipoca, Morro da Lombada, *Marquete et al.* 353 (RB); Conceição de Ibitipoca, Parq. Est. Ibitipoca, to Lombada, *Marquete et al.* 354 (R, RB); Conceição de Ibitipoca, Parq. Est. Ibitipoca, Lagoa Seca, Brejo Alto, *Marquete et al.* 347 (RB); Conceição de Ibitipoca, Parq. Est. Ibitipoca, Barro Preto, *Marquete et al.* 367 (RB); Conceição de Ibitipoca, Parq. Est. Ibitipoca, Barro Preto, *Marquete et al.* 368 (R, RB). **Rio de Janeiro:** Nova Friburgo, *Edmundo* 43 (RB); Petrópolis, Correias, Açú, Morro da Bandeira, *Farney et al.* 804 (RB); Santa Maria Madalena, Parq. Est. Desengano, Pedra do Desengano, *Martinelli et al.* 13251 (RB); Teresópolis, Serra dos Órgãos, Rio Soberbo, *Glaziou* 4093 (NY, R); Serra dos Órgãos, *Gardner* 5811 (CAMB, K, P, R); *Glaziou* 7759 (P); *Luetzelburg* 6545 (P); Serra dos Órgãos-Morro Assu, *Luetzelburg* 6567 (P). Sine loc.: in Brasilia australi, *Tweedie* s.n. (K).

- 12. *Oxypetalum lutescens*** E. Fourn., Fl. Bras. (6)4: 273. 1885. *Gothofreda lutescens* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Rio de Janeiro: Nova Friburgo, Jan. 1874, A. F. M. *Glaziou* 6903 (holotype, P!; isotypes, K!, R!, K photo at RB!, HB!). Figure 6.

Twining vine, branches gold-villose. Leaves with petiole 0.5–2.5 cm, villose, with 2 colleters at blade base; blades 5–9 × 1.8–3.2 cm, ovate-lanceolate or ovate, apically acuminate, basally truncate or ± cordate, adaxially slightly villose, abaxially villose. Inflorescence 1-flowered, cymoid to corymbiform; peduncle ca. 1 cm, villose; pedicels 1–1.5 cm, villose. Floral buds ca. 0.8 cm, conical; calyx lobes 5–7 × 0.5–1 mm, with 1 colleter below each sinus within, linear-triangular, abaxially villose; corolla tube 3–4 mm, campanulate, slightly pubescent outside, glabrous inside, glabrous at throat, lobes 8–15 × 2–2.5 mm, linear, spiralled, reflexed, abaxially pubescent, adaxially glabrous or ± glabrous; corona 2.5–2.7 × 1.5–1.7 mm, rectangular, exserted, apex emarginate, tooth adaxially present, filiform, surpassing to tip of corona lobe; gynostegium 1.3–1.5 mm high, ± sessile; anthers ± triangular, with wings 1–1.5 mm, longer than dorsum; connective appendage 1–1.3 mm, ovate-acuminate; corpusculum 0.58–0.64 × 0.09–0.11 mm, linear, as long as pollinia, thin, not laminar, planar; caudicles 0.30–0.34 mm, fixed up to middle of corpusculum, horizontal, teeth lateral, curved, free; pollinia 0.60–0.65 × 0.23–0.25 mm, cylindrical; style-head 9.5–10 mm, elongate and exserted, bifid at apex with filiform branches. Fruit not seen.

Phenology. Collected in flower in January.

Distribution. Brazil: Rio de Janeiro.

Oxypetalum lutescens is endemic to Rio de Janeiro, growing in Atlantic rainforest. It is quite different

from other species in *Oxypetalum* by its leaves that are villous to slightly villous, the reflexed corolla lobes, the adaxial corona lobes with tooth surpassing its apex, the caudicles broad and inserted along the corpusculum and above the middle, and the filiform style-head elongated and exserted. It is similar to the *O. insigne* group and to *O. lanatum*, *O. schottii*, and *O. regnellii* in its horizontal and broad caudicles. It differs from these taxa by the style-head elongate and exserted with filiform branches, the tooth of the corona lobes clearly surpassing the apex of the lobes, and the broad caudicles fixed up to the middle of the corpusculum. There is only one collection, which was made by *Glaziou* in 1874 (*Glaziou* 6903) and is kept in the herbaria P and R. Modern collecting efforts have not revealed extant populations.

Specimen examined. BRAZIL. **Rio de Janeiro.** Nova Friburgo, ao Alto, *Glaziou* 6903 (R).

- 13. *Oxypetalum molle*** Hook. & Arn., J. Bot. 1: 289. 1834. *Gothofreda mollis* (Hook. & Arn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Santa Catarina: J. *Tweedie* 231 (holotype, K!, K photo at RB!).

Oxypetalum nigrescens E. Fourn., Fl. Bras. 6(4): 264. 1885. *Gothofreda nigrescens* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. São Paulo: “in humidis,” L. *Riedel* 1819 (holotype, LE not seen).

Oxypetalum suaveolens E. Fourn., Fl. Bras. 6(4): 264, pl. 75. 1885. *Gothofreda suaveolens* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Minas Gerais: “Lagoa Santa,” E. *Warming* s.n. (holotype, P!; isotype, C!).

Oxypetalum oliganthum Malme, Kongl. Svenska Vet.-Akad. Handl. 34(7): 46. 1900. TYPE: Brazil. Rio Grande do Sul: “Colônia Ijuhy, inter oppida Santo Angelo e Cruz Alta, 4 Apr. 1893,” G. O. A. *Malme* 754 (holotype, S not seen; isotype, R!).

Oxypetalum campanulatum Hand.-Mazz., Denkschr. Akad. Wiss. Wien, Math.-Nat. 79(2): 381. 1931. TYPE: Brazil. “Apiahy, Feb. 1884,” *Puiggari* s.n. (holotype, W!).

Twining vine, branches tomentose or velvety. Leaves with petiole 0.9–2(3.3) cm, velvety, with 3 or 5 colleters at blade base; blades 4.5–8.5 × 2.3–3.4 cm, oval-lanceolate, camptobrochidodromous, basally cordate to truncate, apically acuminate, adaxially tomentose, abaxially velvety. Inflorescence 2- to 7-flowered, cymoid to corymbiform; peduncle 0.2–2(6) cm, tomentose to velvety; pedicels 14–24 mm, tomentose to velvety. Floral buds 0.9–1.2 cm, triangular; calyx lobes 7–10 × 1–3 mm, with 3 or 4 colleters below each sinus within, triangular to linear-lanceolate, adaxially tomentose, abaxially puberulent or pubescent, with smooth trichomes 122–197 μm;

corolla tube 3.4–6.8 mm, campanulate, pubescent outside, glabrous inside, lobes $9\text{--}14 \times 3.8\text{--}6$ mm, ovate-oblong or ovate-lanceolate, spreading, twisted, abaxially pubescent to puberulent, with smooth trichomes, adaxially verrucose to papillose-verrucose; corona $3.5\text{--}4.5 \times 1.7\text{--}2.8$ mm, oblong to rectangular, apex emarginate to truncate, verrucose, tooth adaxially present, higher than corona lobe, with 2 fleshy processes at base; gynostegium 1.3–1.8 mm high, $\pm$ sessile; anther $\pm$ rhombic, with wings 0.7–1.2 mm, longer than dorsum; connective appendage 1.8–2 mm, oblong; corpusculum $1.16\text{--}1.42 \times 0.28\text{--}0.42$ mm, oblong, narrow at base, thin, laminar, planar; caudicles 0.06–0.16 mm, fixed on base of corpusculum, horizontal, shortly pedicellate, teeth lateral, curved, free; pollinia $0.40\text{--}0.56 \times 0.14\text{--}0.18$ mm, oblong, ellipsoid-oblong; style-head 4.8–5.5 mm, cylindrical, elongate and exserted, thick, bifid from the middle, branches 2.8–3 mm, thick, slightly trilobed. Fruit not seen.

Phenology. Collected in flower in February, March, from May to August, October, and November.

Distribution. Brazil: Goiás, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo; Argentina.

Oxypetalum molle is found in low montane and montane rainforest, disturbed forest, secondary rainforest, seasonal forest, rainforest with *Araucaria*, and in cerrado and cerradão from 150 to 990 m in Brazil. It is quite similar to *O. lanatum* in habit, shape of the corona lobes, and laminar corpusculum. However, it differs from that taxon principally in its corolla lobes adaxially papillose to verrucose and corpusculum almost $3\times$ longer than the pollinia (vs. corolla lobes adaxially glabrous and corpusculum shorter than the pollinia).

Specimens examined. BRAZIL. **Goiás:** Campos Belos, Taguatinga, Rizzo & Barbosa 3784 (RB). **Minas Gerais:** Viçosa, São Miguel, Mexia 4765-a (S). **Paraná:** Manoel Ribas, Hatschbach 33501 (INPA). **Rio de Janeiro:** Petrópolis, Sertão de Carangola, Marquete et al. 285 (R, RB). **Santa Catarina:** Naufragados, Klein & Bresolin 9213 (HBR, RB). **São Paulo:** Limeira, Fazenda Morro Azul, forest of S.A.F.B., Kuhlmann 688 (UB).

14. *Oxypetalum pachyglossum* Decne., Prodr. (DC.) 8: 585. 1844. *Gothofreda pachyglossa* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil, São Paulo: C. B. Gaudichaud 389 (holotype, P!).

Oxypetalum coriaceum Decne., Prodr. (DC.) 8: 585. 1844. *Gothofreda coriacea* (Decne.) Kuntze, Revis. Gen. Pl. 2: 419. 1891. TYPE: Brazil, C. B. Gaudichaud 388 (holotype, P!).

Oxypetalum densiflorum Decne., Prodr. (DC.) 8: 584. 1844. *Gothofreda densiflora* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil, Bahia: "humidis," P. Salzmann 328 (holotype, P!).

Oxypetalum paludosum Decne., Prodr. (DC.) 8: 585. 1844. *Gothofreda paludosa* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil, Bahia: "in paludosis," J. S. Blanchet 2017 (holotype, BM!, BM photo at RB!).

Oxypetalum selloanum E. Fourn., Fl. Bras. 6(4): 260. 1885. *Gothofreda selloana* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil, Bahia: F. Sellow s.n. (lectotype, designated here, F!).

Oxypetalum luschnathii E. Fourn., Fl. Bras. 6(4): 261. 1885. *Gothofreda luschnathii* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 419. 1891. TYPE: Brazil, Bahia: "ad Cruz de Casme," B. Luschnath 235 (holotype, LE not seen, LE photo at RB!).

Oxypetalum villosum E. Fourn., Fl. Bras. 6(4): 262. 1885. Syn. nov. *Gothofreda villosa* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil, Serra Mantiqueira: J. E. B. Pohl 3766 (holotype, W!, W photo at RB!).

Cystostemma glandulosum Silveira, Fl. Serr. Min. 10: tab. 1. 1908. TYPE: Brazil, Minas Gerais: "prope Aguas Virtuosas," Oct. 1899, A. Silveira 285 [Hb. Silveira] (lectotype, designated here, R!).

Twining vine, branches pubescent to glabrous. Leaves with petiole 7.5–20.5 mm, pubescent, with 4 colleters at blade base; blades $5\text{--}15 \times 0.7\text{--}4.2$ cm, oblong to oblong-lanceolate or oblong to lanceolate, brochidodromous, basally cordate, apically acuminate, abaxially usually with conspicuous nerves, abaxially and adaxially glabrous with trichomes at base, near the midnerves. Inflorescence 10- to 13-flowered, dichasially sciadioid-umbelliform; peduncle 16–53(81) mm, pubescent; pedicels 10.6–12 mm, tomentose. Floral buds 0.3–0.4 cm, ovate; calyx lobes $2.5\text{--}3 \times 0.7\text{--}1$ mm, with 2 or 4 colleters below each sinus within, triangular-lanceolate, abaxially pubescent, adaxially glabrous, with smooth trichomes 65–148 μm ; corolla rotate, tube 2–3 mm, pubescent outside, barbellate inside, lobes $4\text{--}4.5 \times 2.5$ mm, oval-lanceolate, widely spread, abaxially and adaxially glabrous; corona $2.5\text{--}3 \times 1.5\text{--}2$ mm, oblong, lobes with profoundly emarginate apex, with 2 linear lateral appendages, slightly shorter than corona; gynostegium 1.8–2 mm high, $\pm$ sessile; anthers rectangular, with wings 0.6–0.8 mm, longer than dorsum; connective appendage 0.7–0.9 mm, ovate; corpusculum $0.48\text{--}0.64 \times 0.16\text{--}0.18$ mm, planar, oblong-lanceolate or lanceolate; caudicles 0.14–0.22 mm, descending, fixed on base of corpusculum, shortly stipitate, teeth included; pollinia $0.62\text{--}0.7 \times 0.20\text{--}0.22$ mm, oblong to ovate, longer than corpusculum; style-head 0.7–0.8 mm, conical, slightly emarginate, shortly exserted, usually included, covered by connective appendages. Follicle $6.8\text{--}9 \times 0.7\text{--}1$ cm, fusiform, with acuminate tip.

pubescent; seeds ovate or oblong, slightly curved, slightly verrucose, $5.5\text{--}6 \times 2.8\text{--}3.5$ mm, coma 8–9 mm.

Phenology. Collected in flower from January to May, July, and November; in fruit in January, March, August, and November.

Distribution. Brazil: Bahia, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, and São Paulo.

Oxypetalum pachyglossum is found in marshes and very wet areas of low montane and montane rainforest, seasonal forest, secondary forest, cerrado, gallery forest, grasslands, campos rupestres, and high-altitude grasslands from 600 to 2000 m in Brazil. It is quite similar to *O. alpinum* in the shape of the leaves and flowers, especially the corona lobes and pollinarium. It differs from this taxon principally in its rotate corolla with the tube adaxially barbellate at throat (vs. a campanulate corolla with the tube adaxially glabrous at throat), corona lobes usually enclosing the gynostegium (vs. corona lobes not enclosing the gynostegium), and the shorter style-head (vs. a longer style-head).

Fontella-Pereira mentioned lectotypification for *Oxypetalum pachyglossum* in the “Resumos XXXVIII Congresso Nacional de Botânica” (1987: 129), referring to *Gaudichaud 389* (P) as lectotype. However, this ephemeral publication is not advised by Recommendation 30A.1 in the *International Code of Botanical Nomenclature* (McNeil et al., 2006), and for this reason we designate the lectotype here. There was no indication in the protologue (Decaisne, 1844) as to where a holotype specimen was deposited. Of the two syntype specimens distributed, the *Gaudichaud 389* (P) specimen is selected.

Lectotypification of *Cystostemma glandulosum* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of the three syntypes examined, the specimen collected by Alvaro Silveira (ex Herbario Silveira 285) in October 1899, is selected.

The name *Oxypetalum selloanum* was described by Fournier in Martius (1885) and transferred to *Gothofreda* (nom. rej.) by Kuntze in 1891. The only specimen mentioned by Fournier was “Ad Bahia: Sello,” and this specimen was found neither in Berlin (B) nor in Paris (P). Therefore, a duplicate of this specimen, *F. Sello s.n.* (F), is selected as lectotype.

Decaisne mentioned the specimens *Blanchet 14* and *Blanchet 2017* in his 1844 protologue of *Oxypetalum paludosum*. A specimen of *Blanchet s.n.* was found in Paris (P), and *Blanchet 2017* was found at the British Museum in London (BM). Therefore, no type is needed or selected here.

Specimens examined. BRAZIL. **Bahia:** Porto Seguro, Porto Seguro and Santa Cruz de Cabralia, Porto Seguro,

Mori et al. (RB-277462). **Minas Gerais:** “in locis uliginosis Bello Horizonte,” A. Silveira, Hb. Silveira 285 (R); prope Barbacena, A. Silveira, Hb. Silveira 285 (R); Ouro Preto, Escola de Farmácia de Ouro Preto, *Fontella 1065 & Badini* (RB); Rancharia, *Valente & Badini* (RB-201604); Mariana, Vazamento de Lixo, *Valente & Badini* (RB-201618). **Rio de Janeiro:** Nova Friburgo, Alto Macaé, *Glaziou 6903a* (R); Petrópolis, Herb. J. Saldanha, Gab. de Bot. da Esc. Politécnica n. 5245 (R). **São Paulo:** São Paulo, Dom Pedro, Jacarei, Campinas, Atabaia, *Gentry & Zardini 49250* (RB); Iporanga, *Pabst 6759 & Pereira 6933* (B, HB).

15. *Oxypetalum pannosum* Decne., Prodr. (DC.) 8: 583. 1844. *Gothofreda pannosa* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. São Paulo: *C. B. Gaudichaud 273* (holotype, P!, P photo at RB!).

15a. *Oxypetalum pannosum* var. *pannosum* Decne.

Twining vine, branches lanose. Leaves with petiole 2–2.2 cm, lanose, with 3 or 4 colleters at blade base; blades $7.5\text{--}8.0 \times 2.5\text{--}2.6$ cm, ovate-triangular to oblong-ovate, camptobrochidodromous, basally cordate or $\pm$ cordate, apically acuminate, adaxially tomentose, abaxially whitish lanose. Inflorescence 8- to 9-flowered, cymoid to corymbiform; peduncle 5–6 mm, lanose; pedicels 1.8–2 mm, lanose. Floral buds 0.6–0.7 cm, elliptical or conical; calyx lobes $4\text{--}5 \times 1\text{--}2$ mm, with 1 colleter below each sinus within, linear-lanceolate, abaxially tomentose, adaxially puberulent, with smooth trichomes $186\text{--}352$ μm ; corolla campanulate, tube 1.8–2 mm, glabrous outside, with smooth trichomes $103\text{--}453$ μm , puberulent inside, lobes $9.5\text{--}10 \times 2\text{--}2.5$ mm, lanceolate, reflexed, twisted, adaxially and abaxially pubescent, with smooth trichomes; corona lobes $1.8\text{--}2 \times 1.3\text{--}1.8$ mm, exserted, obovate or $\pm$ obovate, apex apically truncate, obscuring the anthers, adaxially with tooth reaching up to middle of the corona; gynostegium 1.8–2 mm high, $\pm$ sessile; anthers $\pm$ quadrate, with wings 1.4–1.5 mm, slightly shorter than dorsum; connective appendage 1.8–2 mm, sagittate-triangular, higher than corona and corpusculum; corpusculum $0.90\text{--}0.99 \times 0.26\text{--}0.30$ mm, in frontal view ossiform, in lateral view thickened, not laminar, curved; caudicles 0.10–0.21 mm, horizontal, shortly stipitate, teeth lateral, curved and free; pollinia $0.90\text{--}1.07 \times 0.21\text{--}0.29$ mm, oblong-cylindrical, slightly curvate, equal or approximately equal in size to corpusculum; style-head 3.8–4.8 mm, $\pm$ conical at base, bifid at middle, branches filiform and divergent. Follicle ca. 8.5 mm, fusiform, with acuminate tip, woolly whitish (*A. Loeftgren 8883*).

Phenology. Collected in flower in January and from October to December; in fruit in December.

Distribution. Brazil: Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo. Argentina; Paraguay; Uruguay.

Oxypetalum pannosum var. *pannosum* is found in low montane and montane rainforest, rainforest with *Araucaria*, and grasslands from 450 to 1000 m in Brazil. This species was found for the first time in Rio de Janeiro and is recognized by its leaf blades abaxially whitish lanose and its corpusculum ossiform with a split broader above the middle. It is similar to *O. banksii* subsp. *banksii*, *O. arachnoideum*, *O. cordifolium* subsp. *brasiliense*, *O. cordifolium* subsp. *pedicellatum*, *O. pilosum*, and *O. wightianum* by the corpusculum equal, approximately equal, or slightly longer than the pollinia and the corolla lobes spreading or reflexed. It differs from these taxa in the ossiform shape of the corpusculum and the corona lobes with tooth reaching to the middle of the lobe (vs. tooth short, absent, or with thickened corolla lobes).

Hoehne (1916) described *Oxypetalum pannosum* var. *macranthum* (as "macrantha"), probably from the collection of Dusen and Malme collected in Curitiba. Examination of *Malme* 422 (isosytype, R) showed that *O. pannosum* var. *macranthum* differs from var. *pannosum* in the shape and size of the corolla lobes, the shape of the corona lobes, and the style-head thick, $\pm$ conical at base, abruptly attenuated, and divided in cylindrical branches. The corpusculum in var. *macranthum* is usually surrounded by a spongy, obovate appendage.

Specimens examined. BRAZIL. **Minas Gerais:** Aiuruoca, *Glaziou* 16256 (R). **Rio de Janeiro:** Resende, Visconde de Mauá, *Marquete et al.* 453 (R, RB). **Rio Grande do Sul:** Alto da Serra, Ricarda, *Pereira* 8544 (HB, RB). **Santa Catarina:** Povoado, Anitápolis, *Klein & Bresolin* 10600 (RB). **São Paulo:** Bom Sucesso do Itararé, *Torezan et al.* 549 (ESA).

- 16. *Oxypetalum patulum*** E. Fourn., Fl. Bras. 6(4): 278. 1885. *Gothofreda patula* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Minas Gerais: Serra da Ibitipoca, A. F. C. P. St.-Hilaire 265 (holotype, P!, P photo at RB!). Figure 7.

Oxypetalum hirsutum Silveira, Fl. Serr. Min.: 27. 1908. TYPE: Brazil. Minas Gerais: "in pratis arenosis in Serra do Papagaio, prope Ayuruoca," Nov. 1897. A. Silveira 315 (holotype, R!).

Decumbent shrub, branches villose-hirsute. Leaves with petiole 1–5 mm, villose-hirsute, with 2 colleters at blade base; blades 1–2 $\times$ 0.6–1.2 cm, ovate or elliptical, brochidodromous, apically acute or mucronate, basally cordate or rotundate, adaxially and abaxially slightly villose. Inflorescence 3- to 4-

flowered, sciadioid; peduncle 1–2 cm, villose; pedicels 6–10 mm, villose. Floral buds 0.8–0.9 cm, conical; calyx lobes 4–6 $\times$ 1–1.2 mm, with 4 or 5 colleters below each sinus within, linear, abaxially villose, adaxially pubescent toward apex and glabrous or glabrescent at base, with smooth trichomes 197–954 μ m; corolla campanulate, tube 1.8–2 mm, pubescent outside, puberulent inside, lobes 8–9 $\times$ 1–2 mm, lanceolate, spreading, twisted, abaxially villose, adaxially glabrous, with smooth trichomes; corona lobes 1.8–2 $\times$ 1–1.5 mm, rectangular-spathulate, apex rounded or obtuse, inconspicuous tooth adaxially present at apical portion; gynostegium 1–1.5 mm high, $\pm$ sessile; anthers $\pm$ rhombic, with wings 0.8–1 mm, longer than dorsum; connective appendage 0.5–0.7 mm; corpusculum 0.42–0.49 $\times$ 0.12–0.14 mm, sagittate or $\pm$ sagittate, thick, not laminar, planar; caudicles 0.11–0.12 mm, fixed on base of corpusculum, $\pm$ horizontal, broad and planar, teeth included; pollinia 0.49–0.52 $\times$ 0.14–0.15 mm, elliptical, very slightly longer than corpusculum; style-head 4–5 mm, delicate, elongate and exerted, bifid from the middle with linear branches. Follicle ca. 3.7 $\times$ 0.7 cm, immature, lanceolate, with elongate-acuminate tip, villose; seed not seen.

Phenology. Collected in flower in January, February, and November; in fruit in February.

Distribution. Brazil: Minas Gerais and Rio de Janeiro.

In Brazil, *Oxypetalum patulum* is found in high-altitude grasslands and campos rupestres at ca. 2000 m. This species is quite similar to *O. foliosum* Mart. in its slightly villose leaves, the shape of corona lobes, the caudicles with teeth included, and sagittate or $\pm$ sagittate corpusculum. It differs from this taxon principally in its corona lobes rounded or obtuse at apex (vs. corona lobes truncate at apex) and horizontal caudicles (vs. descending caudicles).

Specimens examined. BRAZIL. **Minas Gerais:** Lima Duarte, Ibitipoca, Parq. Est. Ibitipoca, Pico do Pião, *Marquete et al.* 340a (RB). **Rio de Janeiro:** Itatiaia, Serra Negra, *Porto* 2856 (RB); Parq. Nac. de Itatiaia, Planalto, *Emmerich* 605 & *Andrade* 642 (R); Planalto, *Brade* 20198 (RB).

- 17. *Oxypetalum pilosum*** Gardner, London J. Bot. 1: 539. 1842. TYPE: Brazil. Rio de Janeiro: "among bushes on the ascent of the Pedra Bonita, at Tijuca," G. Gardner 226 (holotype, K!, K photo at HB!, F!). Figure 8.

Oxypetalum propinquum Decne. in DC. Prodr. 8: 582. 1844. nom. illeg. *Gothofreda propinqua* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Brasília Prov.: Rio de Janeiro, *Gardner* 226 (holotype, P!; isotype, G!).

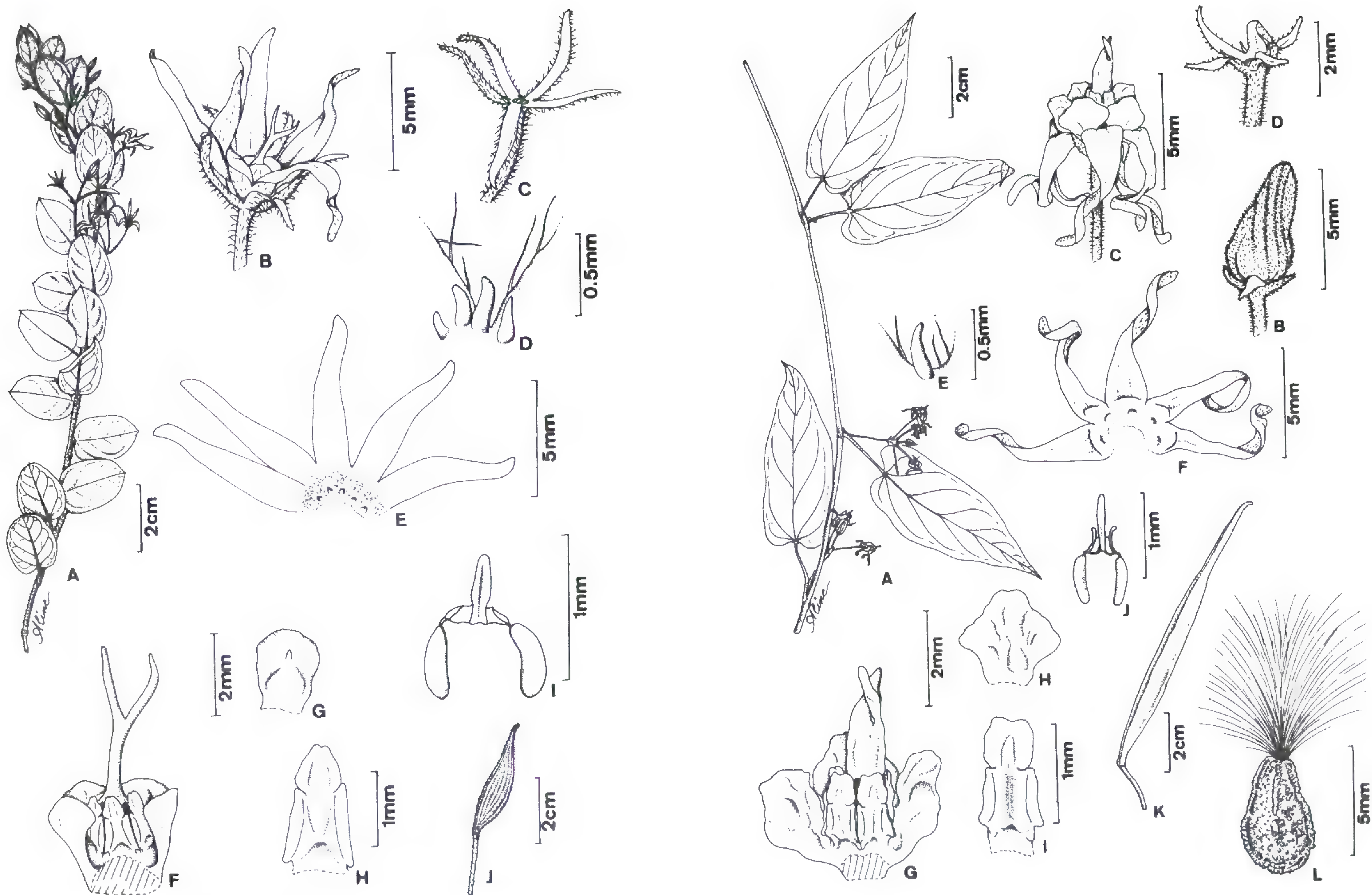


Figure 7 (left). *Oxypetalum patulum*. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Colleters in calyx lobe sinus. —E. Corolla lobes, adaxial view. —F. Corona and gynostegium with corolla lobes removed. —G. Corona lobe, adaxial view. —H. Anther, abaxial view. —I. Pollinarium. —J. Fruit. Drawn from *Brade 20198* by A. S. Lima.

Figure 8 (right). *Oxypetalum pilosum*. —A. Flowering branch. —B. Floral bud. —C. Flower. —D. Calyx. —E. Colleters in calyx lobe sinus. —F. Corolla lobes, adaxial view. —G. Corona and gynostegium with corolla lobes removed. —H. Corona lobe, adaxial view. —I. Anther, abaxial view. —J. Pollinarium. —K. Fruit. —L. Seeds. Drawn from *Sucre 1467* by A. S. Lima.

Oxypetalum deltoideum E. Fourn., Fl. Bras. 6(4): 269. 1885.
Gothofreda deltoidea (E. Fourn.) Kuntze, Revis. Gen.
Pl. 2: 420. 1891, as "*deltodea*." TYPE: Brazil. Rio de
Janeiro, *Reidel s.n.* (holotype, LE!).

Twining vine, branches pubescent. Leaves with petiole 12–30 mm, tomentose, with 3 colleters at blade base; blades $2.5\text{--}5.5 \times 1.5\text{--}3.3$ cm, ovate, ovate-lanceolate, or $\pm$ oblong, campitobrochidodromous, basally cordate, apically acuminate, adaxially pubescent, abaxially tomentose to minutely tomentose. Inflorescence 8- to 9-flowered, cymoid to corymbiform; peduncle 1–1.8 cm, tomentose; pedicels 4–10.5 mm, tomentose. Floral buds 0.4–0.6 cm, ovate-triangular or conical; calyx lobes $2\text{--}3.5 \times 0.5\text{--}0.8$ mm, with 1 colleter below each sinus within, triangular-lanceolate, abaxially tomentose, adaxially glabrous, with verrucose trichomes $60\text{--}124 \mu\text{m}$; corolla campanulate, tube 1.5–2 mm, tomentose outside, glabrous inside, lobes $4.5\text{--}9 \times 0.5\text{--}1.5$ mm, linear, broad at base, reflexed, spiralled, abaxially tomentose, adaxially glabrous, verrucose trichomes; corona lobes $2.0\text{--}2.5 \times 1.4\text{--}2.3$ mm, convex, adaxially tooth absent; gynostegium 4–5 mm high, $\pm$ sessile; anthers $\pm$ quadrate or $\pm$ rhombic, with wings 0.5–0.8 mm, longer than dorsum; connective appendage 0.7–0.9 mm, ovate; corpusculum $0.6\text{--}0.7 \times 0.08\text{--}0.12$ mm, oblong, thin, not laminar, planar; caudicles 0.1–0.16 mm, broad, horizontal, shortly stipitate, with free teeth lateral, curved, exserted; pollinia $0.4\text{--}0.58 \times 0.12\text{--}0.14$ mm, oblong; style-head 2–4 mm, elongate and exserted, thicker at base, bifid from the middle, with slightly thick, linear branches. Follicle $5\text{--}9.8 \times 0.5\text{--}0.7$ mm, fusiform-elongate, with elongate-acuminate tip, pubescent; seeds $6.5\text{--}7 \times 4\text{--}1.5$ mm, ovate, slightly convex, coma 1.5–2 mm.

Phenology. Collected in flower from January to May, in July, and from October to December; in fruit from February to May and from October to December.

Distribution. Brazil: Bahia, Minas Gerais, Espírito Santo, and Rio de Janeiro.

Oxypetalum pilosum is found in secondary rainforest, low montane and montane rainforest, and campos rupestres in Brazil from 400 to 1200 m. This species is quite similar to *O. erostre* E. Fourn. in its leaves, corona lobes $\pm$ rhombic to rounded at the apex, and the pollinarium. It differs from this species principally in its longer corolla lobes (vs. shorter corolla lobes) and the longer and exserted style-head (vs. shorter and less exserted style-head).

Specimens examined. BRAZIL. **Bahia:** Serra Sincorá, Lagoa Encantada, Ibicoara, Brejão, *Harley et al.* 15821 (RB). **Espírito Santo:** Santa Teresa, Mata Fria, Clerio Loss, *Koellmann et al.* 1704 (HRCB). **Minas Gerais:** Sabará,

Hoehne s.n. (S, SP-25096). **Rio de Janeiro:** Nova Friburgo, Morro da Cruz, Colégio Anchieta, *Klein et al.* 286 (RB); Petrópolis, Carangola, *Góes & Constantino* 885 (RB); Rio de Janeiro, Floresta da Tijuca, Bom Retiro, *Fromm* 1143 & *Trinta* 120 (HB, R); Varre e Sae, *Pereira* 26 (HB, RB).

18. *Oxypetalum regnellii* (Malme) Malme. Ark. Bot. 21A(3): 30. 1927. *Calostigma regnellii* Malme, Kongl. Svenska Vet.-Akad. Handl. 34(7): 66. 1900. TYPE: Brazil. Minas Gerais: Caldas, Pedras Brancas Loco aprico, 28 Dec. 1856, *A. F. Regnell III*:73 (lectotype, designated here, S!; isotype, R!).

Twining vine, branches pubescent or slightly pubescent. Leaves with petiole 1–6 cm, pubescent or tomentose, with 4 or 6 colleters; blades $5\text{--}16.3 \times 2.2\text{--}8$ cm, ovate-triangular, campitobrochidodromous, apically acute or acuminate, basally cordate or sagittate-cordate, adaxially pubescent or tomentose, abaxially densely pubescent or tomentose. Inflorescence 3- to 4-flowered, cymoid to corymbiform; peduncle 5–40 mm, pubescent; pedicels 10–20 mm, pubescent or tomentose. Floral buds 0.7–1.2 cm, lanceolate-ovate or lanceolate; calyx lobes $4\text{--}7 \times 0.5\text{--}1$ mm, with 1 or 2 colleters below each sinus within, linear-triangular, abaxially pubescent, adaxially puberulent, with smooth trichomes $122\text{--}241 \mu\text{m}$; corolla campanulate, tube 5–6 mm, pubescent outside, glabrous inside, lobes $15\text{--}20 \times 4\text{--}5$ mm, triangular-lanceolate, spreading or reflexed, twisted, abaxially pubescent, adaxially glabrous or puberulent, with smooth trichomes $53\text{--}89 \mu\text{m}$; corona lobes $5\text{--}7 \times 2\text{--}3.5$ mm, trullate or $\pm$ trullate, apex acuminate, tooth adaxially short at base; gynostegium 2–2.5 mm high, $\pm$ sessile; anthers $\pm$ rectangular, with wings 3.5–4 mm, longer than dorsum; connective appendage 1.2–1.4 mm, $\pm$ triangular; corpusculum $1\text{--}1.40 \times 0.20\text{--}0.25$ mm, $\pm$ claviform, conspicuously longer than pollinia, thick, not laminar, planar; caudicles 0.27–0.39 mm, horizontal, fixed on base of corpusculum, shortly pedicellate, teeth lateral, free; pollinia $0.60\text{--}0.70 \times 0.16\text{--}0.19$ mm, oblong, shorter than corpusculum; style-head 3–5 mm, apex crateriform, irregularly laciniate, with 2 lobes longer. Follicle $7\text{--}9.5 \times 1.7\text{--}1.8$ cm, ovate-fusiform, with acuminate tip, minutely pubescent; seeds $5\text{--}6 \times 2.5\text{--}3$ mm, ovate, verrucose, coma 2.5–3 cm.

Phenology. Collected in flower from January to April, June to August, and October to December; in fruit in April, October, and December.

Distribution. Brazil: Minas Gerais, Rio de Janeiro, and São Paulo.

Oxypetalum regnellii is found in montane rainforest, high-altitude grasslands, and campos rupestres from 1300 to 2200 m in Brazil. This species is quite similar

to *O. insigne* var. *insigne* in its crateriform style-head. It differs from this taxon in its trullate or $\pm$ trullate corona lobes (vs. rectangular or oblong corona lobes) and thickened but not laminar corpusculum (vs. a thinner and laminar corpusculum).

Lectotypification of *Oxypetalum regnellii* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of the three syntype specimens distributed, the specimen *Regnell III:73* (S), is selected as lectotype.

Specimens examined. BRAZIL. **Minas Gerais:** Caldas, Pedra Branca, *Regnell III:73* (S, syntype of *Calostigma regnellii* Malme). **Rio de Janeiro:** Itatiaia, Parq. Nac. Itatiaia, Agulhas Negras, Agulhas Negras and Prateleiras, *I. & G. Gottsberger 14-17471* (UB); Teresópolis, Parq. Nac. Serra dos Órgãos, *Occhioni 1428* (RFA). **São Paulo:** São Bento do Sapucaí, Espinha da Pedra do Baú, *Herbier de Alain Jouy 1242* (HRCB).

- 19. *Oxypetalum schottii*** E. Fourn., Fl. Bras. 6(4): 273, tab. 79, fig. 1. 1885. *Gothofreda schottii* (E. Fourn.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. Rio de Janeiro: A. F. M. Glaziou 7760 (lectotype, designated here, P!; P photo at RB!; isotype, R!).

Oxypetalum sobralii Occhioni, Dusenía 4(3–4): 271. 1953. Syn. nov. TYPE: Brazil. Rio de Janeiro: Caetité, Jun. 1944, D. Constantino & O. C. Goes 623 (holotype, RB!).

Twining vine, branches lanose-tomentose. Leaves with petiole 0.5–1 cm, tomentose, with 4 colleters at blade base; blades 4–6 $\times$ 2–3 cm, elliptical or ovate-lanceolate, camptobrochidodromous, apically acuminate, basally cordate or $\pm$ cordate, adaxially pubescent, abaxially tomentose. Inflorescence (4)6- to 8-flowered, cymoid to corymbiform, $\pm$ sessile; pedicels 15–30 mm, pubescent. Floral buds 0.8–1.3 cm, lanceolate or triangular; calyx lobes 5–6 $\times$ 1–1.5 mm, with 1 or 2 colleters below each sinus within, subulate, abaxially puberulent, adaxially glabrous; corolla campanulate, tube 5–6 mm, puberulent outside, glabrous inside, lobes 10–15 $\times$ 3–4 mm, linear-lanceolate, spreading or reflexed, spiralled, abaxially pubescent, adaxially minutely papillose or glabrate; corona lobes 3.5–4 $\times$ 1.8–2 mm, $\pm$ rectangular, apex emarginate and verrucose, tooth adaxially present with fleshy processes lateral at base; gynostegium 2–2.2 mm high, $\pm$ sessile; anthers $\pm$ quadrate, with wings 1.5–2 mm, longer than dorsum; connective appendage 1.8–2 mm, oblong; corpusculum 1.6–1.8 $\times$ 0.68–0.70 mm, oblong, conspicuously longer than pollinia, thin, laminar, planar; caudicles 0.17–0.22 mm, horizontal, fixed on base of corpusculum, teeth present, lateral, free; pollinia 0.45–0.47 $\times$ 0.19–0.23 mm, elliptical, 3 to

long 4 $\times$ shorter than corpusculum; style-head 4.8–5 mm, bifid at middle, branches lanceolate and with toothed margin. Fruit not seen.

Phenology. Collected in flower in April, June, August, and November.

Distribution. Brazil: Rio de Janeiro.

Oxypetalum schottii is endemic to Rio de Janeiro, growing in montane rainforest at ca. 945 m. It is quite similar to *O. lanatum* in the shape of its corolla and corona lobes, the style-head, and the laminar corpusculum. It differs from this species principally in its branches and leaves lanose-tomentose, pubescent, or tomentose (vs. the branches and leaves tawny-tomentose or woolly), the caudicles appressed at the base of the corpusculum, and the pollinia 3 to 4 $\times$ shorter than the corpusculum (vs. pollinia 2 $\times$ shorter than the corpusculum).

Lectotypification of *Oxypetalum schottii* is necessary because there is no indication in the protologue as to where a holotype specimen was deposited. Of the two syntype specimens distributed, the specimen *Glaziou 7760* (P) is selected.

Specimens examined. BRAZIL. **Brasília:** absque loco speciali, *Schott 5391* (OXF, W, W photo at RB). **Rio de Janeiro:** Caetité, Góes & Constantino 623 (RB).

- 20. *Oxypetalum sublanatum*** Malme, Ark. Bot. 4(3): 6, pl. 1, fig. 3. 1905. TYPE: Brazil. Serrinha, “in paludosis,” 15 Jan. 1904, P. Dúsen 3481 (lectotype, designated here, S!; isotype, R!).

Twining vine, branches villose, lanose, or pubescent. Leaves with petiole 0.7–1.5 cm, villose or tomentose; blades 3.0–6.5 $\times$ 1.2–3.0 cm, oblong or ovate-oblong, basally cordate or $\pm$ cordate, apically mucronate or acuminate, adaxially lanose or pubescent, abaxially lanose. Inflorescence 2- to 4-flowered, sciadioid; peduncle 0.4–1.5 mm, lanose; pedicels 11–12 mm, lanose. Floral buds 0.9–1.3 cm, ovate; calyx lobes 7–8 $\times$ 1.5–2 mm high, with 7 or 8 colleters below each sinus within, linear-lanceolate, acute to apex, abaxially villose, adaxially glabrous at base and pubescent toward apex, with smooth trichomes 142–678 μ m; corolla campanulate, tube 5.5–6 mm, pubescent or tomentose outside, pubescent inside or with trichomes scattered, villose or barbellate at throat, lobes 10–15 $\times$ 4–5 mm, triangular-elongated, reflexed, twisted, apex acute or oblique obtuse, abaxially pubescent or $\pm$ tomentose, adaxially densely puberulent, pubescent, or tomentose, with smooth trichomes (114)131–361 μ m; corona 7–8.2 $\times$ 3.5–4 mm, $\pm$ rectangular, $\pm$ spathulate or oblong, elongate, surpassing the anthers, deeply emarginate at apex, rugose or verrucose, tooth absent; gynostegium 3.5–4 mm high, stipitate; anthers

$\pm$ rhombic, with wings 1.8–2 mm, longer than dorsum, slightly divergent at base; connective appendage 2–3 mm, ovate or oblong; corpusculum $2.04\text{--}4.10 \times 0.56\text{--}1.02$ mm, rectangular or $\pm$ rectangular, apex truncate or rotundate, curved in side view, thin, laminar, enclosed by the connective appendages; caudicles 0.28–0.36 mm, horizontal or $\pm$ horizontal, teeth 0.47–0.70 mm, free and curved; pollinia $0.70\text{--}0.86 \times 0.27\text{--}0.42$ mm, oblong or $\pm$ elliptical, with tip rotundate or obtuse; style-head 1.3–3 mm, conical, usually included by corona and usually $\pm$ entire at apex. Follicle $5\text{--}6.9 \times 1.8\text{--}1.9$ mm, fusiform, apex elongate-acuminate, base acute or obtuse, villose or tomentose; seeds not seen.

Phenology. Collected in flower in January, November, and December; in fruit in June.

Distribution. Brazil: Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, and São Paulo; Argentina (Meyer, 1944).

Oxypetalum sublanatum is found in high-altitude grasslands, grasslands, campos rupestres, rainforest with *Araucaria*, gallery forest, and marshes in Brazil from 1200 to 1900 m. It is quite similar to *O. lanatum* in habit, shape, the pubescence of the leaf blade, flowers, corona lobes, and laminar corpusculum. It differs from this species principally in its exerted corona lobes that enclose the style-head, which is usually $\pm$ entire (vs. the corona lobes only partially enclosing the style-head).

Specimens examined. BRAZIL. **Minas Gerais:** Passa Quatro, Pico do Muro, *Brade 18978 & Silva Araujo* (RB). **Paraná:** Ponta Grossa, Parq. Est. Vilha Velha, *Occhioni 3472* (RFA). **Rio de Janeiro:** Itatiaia, Nova Estrada, *Brade 17272* (RB); Serra do Itatiaia, Planalto, *Pereira 7619* (HB, RB). **Santa Catarina:** Campo Alegre, Morro Iquererim, *Smith & Klein 8506* (RB). **São Paulo:** Bocaina, *Markgraf & Duarte 10261* (RB).

21. *Oxypetalum wightianum* Hook. & Arn., J. Bot. 1: 288. 1831. *Gothofreda wightiana* (Hook. & Arn.) Kuntze, Revis. Gen. Pl. 2: 421. 1891. TYPE: Brazil. "hedges near Portalagree, rare," *J. Tweedie 227* (holotype, K, K photo at RB!).

Oxypetalum guilleminianum Decne., Prodr. (DC.) 8: 582. 1844. *Gothofreda guilleminiana* (Decne.) Kuntze, Revis. Gen. Pl. 2: 420. 1891. TYPE: Brazil. "prov. Rio de Janeiro, Serra dos Orgãos," *J. B. A. Guillemín 915* (holotype, P!, P photo at RB!; isotype, P fragment at P!).

Oxypetalum squamulatum E. Fourn., Fl. Bras. 6(4): 270. 1885. TYPE: [Brazil.] "in Brasilia meridionali," *F. Sello 4317* (holotype, B!).

Twining vine, branches tomentose. Leaves with petiole 1.5–4 cm, tomentose, with 4 colleters at blade

base; blades $4\text{--}9(12.5) \times 1.5\text{--}4$ cm, lanceolate-triangular or oblong-triangular-ovate to ovate-triangular, camptobrochidodromous, basally cordate to sagittate, apically acuminate, adaxially pilose or puberulent, abaxially pubescent. Inflorescence 3- to 4-flowered, cymoid to corymbiform; peduncle 3–7.5 mm, tomentose; pedicels 6.6–20 mm, tomentose. Floral buds 0.5–1.1 cm, linear-lanceolate or lanceolate; calyx lobes $3\text{--}3.5 \times 0.4\text{--}0.5$ mm, with 1 to 3 colleters below each sinus within, linear-lanceolate, abaxially pubescent, adaxially puberulent, with smooth trichomes $99\text{--}209 \mu\text{m}$; corolla campanulate, tube 2–2.5 mm, pubescent outside, puberulent inside, lobes $12\text{--}15 \times 1.5\text{--}2$ mm, linear or linear-lanceolate, reflexed, spiralled, abaxially pubescent, adaxially puberulent, smooth trichomes $56\text{--}136 \mu\text{m}$; corona lobes $1.7\text{--}2.5 \times 1\text{--}1.2$ mm, trilobate, process rounded or thickened, heart-shaped adaxially up to middle of corona lobes; gynostegium 1.2–1.5 mm high, sessile or $\pm$ sessile; anthers $\pm$ quadrate, with wings 0.5–0.8 mm, longer than dorsum; connective appendage 1–1.2 mm, ovate; corpusculum $0.5\text{--}0.54 \times 0.06\text{--}0.08$ mm, linear, widened above at middle, boat-shaped in outline, thick, not laminar, curved; caudicles 0.1–0.14 mm, horizontal, fixed on base at middle of corpusculum, broad, teeth lateral, curved, free; pollinia $0.36\text{--}0.4 \times 0.1\text{--}0.12$ mm, oblong, curved equal to the corpusculum; style-head 4–6 mm, elongate and exerted, bifid from the middle, rarely at base, branches broad and linear. Follicle $1\text{--}7.5(9.5) \times 1\text{--}1.5(4.5)$ cm, elongate-lanceolate, tuberculate, tomentose; seeds $7.5\text{--}10 \times 3.2\text{--}4$ mm, lanceolate-ovate, slightly verrucose, coma 1.2–2 cm.

Phenology. Collected in flower from January to April, June, July, and October to December; in fruit in January, March, April, and May.

Distribution. Brazil: Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo; Paraguay (Fontella-Pereira et al., 1985).

Oxypetalum wightianum is found in low-montane rainforest, montane rainforest, secondary rainforest, grasslands, and often along watercourses in Brazil from 700 to 1800 m. It is quite similar to *O. pilosum* in the corpusculum equal to or slightly longer than the pollinia and the reflexed corona lobes. It differs from this species principally in its trilobate corona lobes that are adaxially thickened and heart-shaped (vs. $\pm$ rhomboid, slightly trilobate corona lobes with tooth absent) and a corpusculum that is linear and wider above the middle, boat-shaped in outline (vs. narrowly oblong, rectangular in outline).

Specimens examined. BRAZIL. **Minas Gerais:** Ouro Preto, Morro da Queimada, *Valente & Badini* (RB-201623);

Serra do Antonio Pereira, Valente & Badini (RB-201617). **Paraná:** Vila Velha, *Dusén* 222a (BM); Tijucas do Sul, Represa de Vossoroca, *Kummrow* 1031 (MBM, RFA). **Rio de Janeiro:** Nova Friburgo, Pico da Caledônia, *Marquete et al.* 428 (RB); Resende, Visconde de Mauá, Alto da Serra Selada, *Marquete et al.* 452 (R, RB); Rio de Janeiro, Res. Biol. Jacarepaguá, *Castellanos* 23421 (GUA); Teresópolis, Estrada Nova, Soberbo, *Occhioni* 1286 (RB). **Rio Grande do Sul:** Silveira Martins, *Malme* 678 (BM, S). **Santa Catarina:** Blumenau, *Dobereiner & Tokarnia* 436 (RB). **São Paulo:** Jundiaí, Serra do Japi, *Leitão Filho et al.* 13093 (SPF).

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